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PARTICLE ACCELERATORS

I. BIBLIOGRAPHY

II. LIST OF ACCELERATOR INSTALLATIONS

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PARTICLE ACCELERATORS

I. BIBLIOGRAPHY

II. LIST OF ACCELERATOR INSTALLATIONS

Gerald A. Behman

January 1, 1958

PARTICLE ACCELERATORS

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ABSTRACT

References to accelerators and accelerator technology in the technical literature from July 1954 through June 1957 are listed in Section I, the bibliography. Most of the references are taken from Nuclear Science Abstracts, Chemical Abstracts, Physics Abstracts, and Electrical Engineering Abstracts.

In Section II, accelerator installations throughout the world are listed together with the types of particles accelerated and the energy and other characteristics of the machines.

PARTICLE ACCELERATORS

I. BIBLIOGRAPHY

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January 1, 1958

INTRODUCTION

This bibliography supplements the following compilations:

1. E. Thomas, P. Mittelman, and H. H. Goldsmith, Particle Accelerators; Bibliography and List of High-Energy Installations, BNL-L-101 and AECU-31 (July 1, 1948).
2. Bonnie E. Cushman, Bibliography of Particle Accelerators July 1948 to December 1950, UCRL-1238 (March 1951).
3. Sergey Shewchuck, Bibliography of Particle Accelerators January to December 1951, UCRL-1951 (September 1952).
4. F. E. Frost and J. M. Putnam, Particle Accelerators, I. Bibliography. II. List of High-Energy Installations, UCRL-2672 (November 16, 1954).

For this compilation, the literature searched includes Nuclear Science Abstracts, Chemical Abstracts, Physics Abstracts (Science Abstracts A), and Electrical Engineering Abstracts (Science Abstracts B) for the period from July 1954 through June 1957. Also included are certain articles and references not derived from the above abstracts. References are arranged in groups according to the accelerator classification and are arranged alphabetically within the accelerator group by author's surname. An author index listing all authors is provided, and each bibliography entry is numbered to facilitate searching for the work of individual authors with the aid of the author index. Articles by companies, societies, organizations, and institutions are arranged alphabetically by source in the author index.

The abbreviations used here include NSA for Nuclear Science Abstracts, CA for Chemical Abstracts, SA A for Physics Abstracts, and SA B for Electrical Engineering Abstracts. Typical examples of the notation system used in this report to describe entries in these publications are:

UCRL-8050 Notation

Explanation

NSA <u>8</u> , 3873 (54)	This is Abstract 3873 of Volume 8 of Nuclear Science Abstracts issued in 1954.
CA <u>48</u> , 9821e (54)	This Abstract is located in Section e of Column 9821 in Volume 48 of Chemical Abstracts for 1954.
SA <u>A57</u> , 6671 (54)	This is Abstract 6671 of Volume 57 of Physics Abstracts (Science Abstracts A) issued in 1954.
SA <u>B57</u> , 6671 (54)	This is Abstract 6671 of Volume 57 of Electrical Engineering Abstracts (Science Abstracts B) issued in 1954.
G. B.	This entry has been noted directly from the literature by the author of this bibliography.

In the preparation of this bibliography every effort has been made to include pertinent publications in the correct categories. Articles of a general nature in the accelerator field are grouped under the heading General. Those articles that discuss more than one type of machine are included in each of the appropriate accelerator groups. Publications that could not readily be classified in any of the aforementioned groups are listed under Miscellaneous.

The author will appreciate notification of duplications, omissions, or other shortcomings in this bibliography.

BIBLIOGRAPHY

GENERAL

- 1 Burshtein, Veksler, and Kolomenskii
A stochastic method of accelerating particles. Doklady Akad. Nauk S.S.S.R. 101, 3-6 (1955) (In Russian).
SA A59, 2184 (56)
- 2 Burshtein, Veksler, and Kolomenskii
A stochastic method of accelerating particles. AEC-tr-2268, 6 p. (1955), translated from p. 3-6 in "Certain problems of the cyclic accelerators," Doklady Akad. Nauk S.S.S.R. 101, 3-6 (1955).
NSA 10, 1589 (56)
- 3 D. R. Chick and C. W. Miller
Particle accelerators and their applications I, II. Brit. Commun. and Electronics, 539-45 and 596-601 (1956).
SA A60, 885 (57)
- 4 J. D. Cockcroft and T. G. Pickavance
High-energy particle accelerators. Endeavor 14, 61-70 (1955).
CA 50, 686g (56)
- 5 Conference on physics of high-energy particles (Tbilisi, S.S.S.R., October, 1956).
Uspekhi Fiz. Nauk S.S.S.R. 61, 103-28 (1957) (In Russian).
NSA 11, 6181 (57)
- 6 Frederick E. Frost and Jane M. Putnam
Particle accelerators. I. Bibliography. II. List of high-energy installations. California, Univ., Berkeley, Rad. Lab., UCRL-2672, 83 p. (1954).
NSA 10, 1585 (56)
- 7 J. W. Gallop
Variable-energy particle accelerators. Nature 179, 492 (1957).
NSA 11, 5635 (57)
- 8 A. A. Kolomenskii and N. B. Rubich
Accelerators of charged particles. Priroda 44, 3-12 (1955) (In Russian).
NSA 10, 1591 (56)
- 9 E. H. Krause
Particle accelerators. American Inst. of Physics Handbook, F.N.D. Kurie, Ed. (McGraw--Hill, New York, 1957) chap. 8i, p. 8-172 to 8-201
G. B.

- 10 Ernest O. Lawrence
High-current accelerators. *Science* 122, 1127-32 (1955).
NSA 10, 2185 (56)
- 11 H. K. Lewis
The annual review of nuclear science II. Stanford: Annual Reviews;
London: IX + 429 p. (1953). Review in *Proc. Phys. Soc. [London]*
A, 66, 1198-9 (1953).
SA A57, 1544 (54)
- 12 Stanley M. Livingston
High-energy accelerators. New York, Interscience Publishers, Inc.,
157 p. (1954)
NSA 9, 3992 (55)
- 13 W. K. H. Panofsky and W. A. Wenzel
Some considerations concerning the transverse deflection of charged
particles in radiofrequency fields. *Rev. Sci. Instr.* 27, 967 (1956).
SA B60, 3006 (57)
- 14 G. Perona, and A. Persano
Technical aspects of particle accelerators. *Energia Nucleare* 7, 161-
8 (1953) (In Italian).
NSA 8, 6315 (54)
- 15 Pickavance, Skyrme, and Stafford
High-energy nuclear physics. *Nature (London)* 178, 115-18 (1956).
SA A59, 8951 (56)
- 16 E. P. Rosenbaum
Physics in the U.S.S.R. *Scientific American* 195, No. 2, 29-35
(1956).
G. B.
- 17 K. Simonyi
Some problems of construction and design of a nuclear physics accel-
eration mechanism for particle energies of several Mev. *Nuovo*
cimento (10) 3, Suppl. 3, 345-62 (1956)
NSA 10, 10602 (56)
- 18 H. Stamm
Modern methods for the production of high voltages and high (particle)
accelerations. *Wiss. Z. Hochsch. Elektrotech. Ilmenau* 2, 33-49
(1956) (In German).
SA B60, 306 (57)
- 19 V. I. Veksler
Principles of acceleration of charged particles. *Soviet J. Atomic*
Energy 1, 77-83 (1956).
NSA 10, 11544 (56)

- 20 W. Walkinshaw
Acceleration of protons to high energies. *Research* 8, 295-300 (1955).
NSA 9, 6781 (55).

D. C. MACHINES

- 21 Ageno, Cortellessa, and Querzoli
Some installations and auxiliary devices for research in nuclear physics. *Rend. ist. super. sanita* 16, Pts. I, II, and III, 28-38 (1953) (In Italian).
SA A57, 6668 (54) and CA 48, 9823h (54)
- 22 Katarina Ahnlund
Determination of the radiation hazards from a 1.5-Mev high-voltage accelerator. *Arkiv Fysik* 7, 149-53 (1953).
CA 48, 5661i (54) and SA A57, 7950 (54)
- 23 Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, Richman, and Woodyard
Berkeley proton linear accelerator. *Rev. Sci. Instr.* 26, 111-33 (1955).
SA A58, 4732 (55); SA B58, 2526 (55); and CA 49, 12143c (55)
- 24 G. J. Atchison and W. H. Beamer
Neutron activation analysis with the Van de Graaff accelerator. Application to the halogens. *Anal. Chem.* 28, 237-43 (1956).
CA 50, 6969b (56)
- 25 Baev, Vorotnikov, Gokhberg, Sidorov, Shuf, and Yan'kov
High-voltage electrostatic generator in compressed gas. *Doklady Akad. Nauk S.S.S.R.* 101, 637-9 (1955) (In Russian).
NSA 9, 5169 (55) and SA A58, 7129 (55)
- 26 Baev, Vorotnikov, Gokhberg, Sidorov, Shuf, and Yan'kov
High-voltage electrostatic generator in compressed gas. AEC-tr-2178 (In English) translated from *Doklady Akad. Nauk S.S.S.R.* 101, 637-9 (1955).
NSA 9, 5511 (55).
- 27 R. Barjon and J. Schmouker
Recent modifications to the 2-Mev Van de Graaff at the Polytechnical School. *J. phys. radium* 17, 594-5 (1956) (In French).
NSA 10, 10607 (56) and SA A60, 1381 (57).
- 28 J. Bergstein and R. D. Birkhoff
Performance of a 125-kv accelerator and spectrometer. *Phys. Rev.* 91, 223 (1953).
CA 49, 10069h (55)

- 29 E. J. Bertomeu and C. A. Mallmann
Operation of a high-voltage cascade generator. *Publs. com. nacl. energia atomica* (Buenos Aires), Misc., No. 1, 1-16 (1954) (In Spanish).
NSA 9, 4583 (55).
- 30 T. W. Bonner
Van de Graaff and Cockcroft-Walton accelerators for fast-neutron cross-section measurements. *Proc. Intern. Conf. Peaceful Uses Atomic Energy*, Geneva, 1955, No. 4, 92-6 (1956)
CA 50, 12667a (56).
- 31 Brovchenko, Gokhberg, and Morozov
Stabilization of energies of ions accelerated by a high-voltage electrostatic generator. *Doklady Akad. Nauk S.S.S.R.* 101, 1023-5 (1955) (In Russian).
NSA 9, 5170 (55).
- 32 Brovchenko, Gokhberg, and Morozov
Stabilization of energies of ions accelerated by a high-voltage electrostatic generator. AERE-Lib/Trans-582, translated from *Doklady Akad. Nauk S.S.S.R.* 101, 1023-5, (1955) 4 p.
NSA 10, 1590 (56).
- 33 H. Bruck and G. Gendreau
Ionic optics of the Van de Graaff beam. *L'Onde Électrique* 35, 1009-21 (1955) (In French).
NSA 11, 724 (57) and SA A59, 5946 (56).
- 34 Bumiller, Meyer, Straub, and Winkler
Electrical equipment for a Van de Graaff generator. *Z. Naturforsch.* 10a, No. 7, 551-6 (1955) (In German).
SA A59, 414 (56) and SA B58, 5277 (55).
- 35 D. R. Chick and D. P. R. Petrie
An electrostatic particle accelerator. *Proc. Instn. Elect. Engrs.* 103B, Paper No. 1869m, p. 132-45 and 152-4 (1955).
SA B58, 3368 (55) and SA B59, 1947 (56).
- 36 M. Clark
Shielding of a high-current cyclotron and a Van de Graaff machine. *U. S. Atomic Energy Comm. Rept.* BNL-227, 1-16 (1952).
CA 48, 10441c (54).
- 37 C. J. Cook and W. A. Barrett
Regulator for a 20- to 250-kv Cockcroft-Walton accelerator. *Rev. Sci. Instr.* 24, 638-40 (1953).
CA 48, 9821b (54).

- 38 B. Cork
Proton linear-accelerator injector for the Bevatron. *Rev. Sci. Instr.* 26, 210-19 (1955).
SA A58, 4733 (55); SA B58, 2527 (55); and CA 49, 12143h (55).
- 39 Cottingham, Plotkin, and Raka
Electronic equipment for an electron analogue accelerator. *I. R. E. Trans. Nuclear Sci.* NS-1, 12-17 (1954).
NSA 10, 1592 (56).
- 40 J. D. Craggs and J. M. Meek
High-voltage laboratory technique. Butterworth's Scientific Publications (London) (1954) X + 404 p.
SA B57, 3706 (54).
- 41 Cranberg, Aiello, Beauchamp, Lang, and Levin
Energy modulation for particle accelerators. *Rev. Sci. Instr.* 28, 84-8 (1957).
NSA 11, 5054 (57).
- 42 de Boer, Kley, and Makkink
Control and measurement of an ion source of a pressure-insulated Van de Graaff generator. *Rev. Sci. Instr.* 27, 614-18 (1956).
NSA 10, 11540 (56) and SA A59, 8247 (56).
- 43 Dunning, Bondelid, Fagg, Kennedy, and Wolicki
Development and performance of NRL's large electrostatic accelerator. Naval Research Lab., Wash. D. C., Progress Report (May, 1955).
G. B.
- 44 D. T. Eggen and H. Kenworthy
The NAA statitron as a facility for solid-state research. *Phys. Rev.* 92, 531 (1953).
CA 49, 10073e (55).
- 45 Noel J. Felici
The dielectric properties of pure hydrogen and its application to electrostatic generators having insulated conductors. *Compt. rend.* 237, 979-82 (1953).
CA 48, 4909i (54).
- 46 T. R. Foord
A portable Van de Graaff generator. *J. Sci. Instr.* 31, 440-1 (1954).
SA A58, 994 (55) and SA B58, 683 (55).
- 47 A. Gabet
Regulation of the field of the Van de Graaff beam deflection electromagnet. *L'Onde Electrique* 35, 1022-9 (1955) (In French).
NSA 11, 725 (57).

- 48 A. Gabet and J. Taieb
Voltage regulation in the Saclay Van de Graaff generator. *L'Onde Electrique* 35, 1033-47 (1955) (In French).
NSA 11, 727 (57) and SA B59, 2254 (56).
- 49 Gatti, Perona, and Persano
Pulse generator of neutrons. AEC-tr-1953, translated from *Nuovo cimento* (9) 10, 80-6 (1953) (In English).
NSA 9, 3307 (55).
- 50 Godsia, Simon, Solomon, and Weber
Experimental program using Van de Graaff facilities. Westinghouse Electric Corp., Atomic Power Div., WAPD-ADC-22, 17 p. (Sept. 1956).
NSA 11, 4900 (57).
- 51 Goldie, Wright, Anson, Cloud, and Trump
Feasibility of compact 4-Mev electrostatic x-ray source. Studies of compressed gas and high-vacuum insulation. Supplementary final report for the period June 1952 through June 1954. Massachusetts Inst. of Tech., High-Voltage Research Lab., NP-5447, 47 p. (1954).
NSA 9, 1368 (55).
- 52 Gorlov, Gokhberg, Morozov, and Otroshchenko
Small electrostatic generator in compressed gas. *Doklady Akad. Nauk S.S.S.R.* 102, 237-9 (1955) (In Russian).
NSA 9, 5513 (55).
- 53 Maurice Guegen
The one Mev generator and the ion accelerator of the Centre de Physique Nucleaire de Liege. *Bull. sci. A.I.M. (Belg.)* 67, 39-64 (1954) (In French).
NSA 9, 6779 (55) and SA B57, 3358 (54).
- 54 Walter Heilpern
Cascade generator for the acceleration of particles at 4 Mev. *Helv. Phys. Acta* 28, 485-91 (1955) (In German).
NSA 10, 1936 (56); SA A59, 3782 (56); and CA 50, 6942b (56).
- 55 Janner, Magun, and Schopper
High voltage generator of the Van de Graaff type with liquid charge transport. *Z. angew. Phys.* 7, 446-50 (1955) (In German).
NSA 10, 6003 (56); SA A59, 413 (56); and SA B58, 5179 (55).
- 56 Kansas, University
Van de Graaff generator project final report for February 1, 1948 to December 31, 1954. Kansas, University, Lawrence, NP-5700, 50 p. (1954).
NSA 9, 5782 (55).

- 57 J. Kessler
Externally excited Van de Graaff generator with high belt-charge densities. *Ann. Phys. [Leipzig]* 15, 406-16 (1955) (In German).
SA A58, 8811 (55) and SA B58, 5180 (55).
- 58 J. A. H. Kersten
The cascade generator for high direct voltages. *Electrotech. Z.* 32, 215-19 (1954) (In German).
SA B57, 4232 (54).
- 59 Kostka, Mérey, and Schmidt
Studies on Van de Graaff type generators operated under high gas pressure. *Elektrotechnika* 48, 201-10 (1955) (In Hungarian).
SA B58, 4789 (55).
- 60 Chris E. Kuyatt
Study of secondary electrons in gases. Nebraska, Univ., Lincoln, AECU-3422, 14 p. (1957).
NSA 11, 5402 (57).
- 61 Lafferty, Biggerstaff, Kern, and Hahn
A high-current 120-kev positive-ion accelerator. *Phys. Rev.* 91, 223 (1953).
CA 49, 10069h (55).
- 62 Gérard Lehmann
General principles of the automatic voltage regulation of the Saclay Van de Graaff accelerator. *L'Onde Électrique* 35, 1006-8 (1955) (In French).
NSA 11, 723 (57) and SA B59, 2255 (56).
- 63 Lorrain, Béique, Gilmore, Girard, Breton, and Piché
A high-frequency 500-kilovolt Cockcroft-Walton accelerator. *Can. J. Phys.* 35, 299-312 (1957).
NSA 11, 5634 (57).
- 64 B. G. Maglie
Equipment for the production of neutrons with a 1.5-Mev accelerator. *Atoms (Engl.)* 5, No. 3, 85-90 (1954).
CA 48, 8070e (54).
- 65 D. Magnac-Valette and M. M. Liess
Slow-leak tritium source suitable for a Van de Graaff generator. *J. phys. radium* 17, 449-50 (1956) (In French).
NSA 10, 10606 (56); SA A60, 2322 (57); and CA 50, 12674f (56).
- 66 B. Marsicanin and M. Rakic
Certain auxiliary instruments of the 1.5-Mev accelerator. *Bull. Inst. Nuclear Sci. "Boris Kidrich" (Belgrade)* 3, 103-9 (1953).
NSA 9, 1654 (55).

- 67 W. Messerschmidt
Atomic transformations with technical equipment. *Urania* 15, 161-75 (1952).
CA 49, 731d (55).
- 68 B. Millar
The calculation of voltage surges in a Van de Graaff generator. *Brit. J. Appl. Phys.* 6, 13-15 (1955).
NSA 9, 2467 (55); SA A58, 1912 (55); and SA B58, 1117 (55).
- 69 Moreau, Prevot, and Vienet
Study of a pulsed source of deuterons. *L'Onde Electrique* 35, 1064-9 (1955).
NSA 11, 730 (57).
- 70 J. E. Morgan and F. Ellinger
Radiation dosimetry in biological research. *Radiology* 66, 877-86 (1956).
SA A60, 445 (57).
- 71 A. J. Moses, and J. Saldick
Electron accelerator used for producing neutrons. *Nucleonics* 14, No. 9, 118-19 (1956).
NSA 10, 12064 (56) and SA A60, 3346 (57).
- 72 N. Narayan and K. S. Parahhu
Production of standard waves with a 3000-kv impulse generator. *J. Indian Inst. Sci. B* 34, 113-22 (1952).
SA B57, 4231 (54).
- 73 H. Neuert and U. Timm
A simple lens system for variable-voltage Van de Graaff generators. *Z. Naturforsch.* 10a, 603-5 (1955) (In German).
SA A59, 1299 (56).
- 74 Nuclear Engineering 1, 250-1 (1956)
A versatile Van de Graaff. Flexible operation a feature of new S. T. L. unit.
NSA 10, 12063 (56).
- 75 J. Pech
A survey of the developments of Van de Graaff generators. *Electro-tech. Obzor.* 43, 257-63 (1954) (In Czech).
SA B58, 2787 (55).
- 76 R. A. Peck, Jr. and H. P. Eubank
High-current Cockcroft-Walton accelerator for neutron production. *Rev. Sci. Instr.* 26, 444-8 (1955).
NSA 9, 5172 (55); CA 49, 12143e (55); and SA A58, 6531 (55).

- 77 R. A. Peck, Jr.
Characteristics of a high-frequency Cockcroft-Walton voltage source.
Rev. Sci. Instr. 26, 441-4 (1955).
SA A58, 7132 (55).
- 78 M. Peter
Lecture demonstration of relativistic behavior of electrons. Amer.
J. Phys. 23, 515-17 (1955).
SA A59, 395 (56).
- 79 D. Pinet
Regulation of the beam position in the Saclay Van de Graaff. L'Onde
Electrique 35, 1030-2 (1955) (In French).
NSA 11, 726 (57) and SA B59, 2253 (56).
- 80 F. Prévot and R. Vienet
Production of an intense pulsed beam of deuterons. J. phys. radium
16, 238 (1955) (In French).
NSA 9, 3666 (1955); CA 49, 12979d (55); and SA A58, 6224 (55).
- 81 Edwin J. Rogers
Current regulator for Van de Graaff magnet. Electronics 28, No. 10,
151-3 (1955).
NSA 9, 7559 (55).
- 82 A. W. Simon
On the theory of the Van de Graaff electrostatic generator. Am. J.
Phys. 22, 318-26 (1954).
NSA 8, 3871 (54); SA A57, 6588 (54); and SA B57, 3705 (54).
- 83 O. Specchio and A. Cambieri
A 560-e.k.v. particle accelerator. Rend. ist. lombardo sci., Pt. I,
Classe sci. mat. e. nat. 90, 14-22 (1956).
CA 51, 877d (57).
- 84 Strumski, Cooper, Frisch, and Zimmerman
Hydrogen supply and beam focusing for electrostatic generator. Rev.
Sci. Instr. 25, 514 (1954).
NSA 8, 4428 (54) and CA 48, 13283b (54).
- 85 A. C. van Dorsten and J. H. Spaa
A high output d-d neutron generator for biological research. Nuclear
Instr. 1, 259 (1957).
G. B.
- 86 R. Ray Weeks
An alignment procedure for an electrostatic analyzer. IRE Trans.
Nuclear Sci. NS-2, 12-13 (1955).
NSA 9, 6782 (55).

- 87 H. C. Whitby
Compact d.c. power supplies in the 100 kv region. Atomic Energy
Research Establishment, Harwell, England, AERE-GP/R-1855, 8 p.
(1956).
SA A59, 5945 (56) and SA B59, 3264 (56).
- 88 John M. Wilcox
Strong-focusing Cockcroft-Walton accelerator. California, Univ.,
Berkeley, Rad. Lab., UCRL-3184, 20 p. (1955).
NSA 10, 3045 (56).
- 89 S. D. Winter
Electrostatic generator. L'Onde Électrique 35, 995-1005 (1955)
(In French).
NSA 11, 722 (57) and SA B59, 2252 (56).
- 90 Peter Wootton
Notes on the isodose curves from a 2-Mev Van de Graaff machine.
Am. J. Roentgenol. Radium Therapy Nuclear Med. 76, 929-33
(1956).
NSA 11, 720 (57).

BETATRONS

- 91 F. T. Adler and D. Baroncini
Approximations for linear betatron oscillations. Nuovo cimento (10)
4, 959-74 (1956).
NSA 11, 2158 (57) and SA A60, 2289 (57).
- 92 Allen, Ashworth, and Siddal
Internally metalizing a betatron by vacuum deposition. J. Sci. Instr.
33, 445-6 (1956).
CA 51, 4061h (57).
- 93 Asada, Furuta, Masuda, Koga, Okamura, Hiraoka, Ookuma, and Fujita
24-Mev betatron of Osaka University. Ann. Rept. Sci. Works, Fac.
Sci., Osaka Univ. 3, 25-33 (1955).
CA 50, 4655h (56).
- 94 E. Bagge
The measurement of current impulses of free atomic charge carriers
with the inductometer. Naturwissenschaften 42, No. 5, 120 (1955).
(In German).
SA A58, 7997 (55)
- 95 G. C. Baldwin
Betatron-orbit stability studies. Phys. Rev. 98, 1152 (1955).
CA 50, 10549i (56).

- 96 G. C. Baldwin
Neutron production by electron bombardment of uranium. *Phys. Rev.* 104, 1652-3 (1956).
CA 51, 7184d (57).
- 97 Baldwin, Elder, and Westendorp
Experimental studies of betatron orbit stability. *J. Appl. Phys.* 25, 1553-5 (1954).
NSA 9, 1370 (55) and SA A58, 2783 (55).
- 98 E. B. Bas
A new electron source for betatron. *Helv. Phys. Acta* 27, 221-2 (1954) (In German).
NSA 8, 5728 (54) and CA 49, 66f (55).
- 99 R. Basile and C. Schuhl
Energy calibration of a 22-Mev betatron. *J. phys. radium* 16, 372-7 (1955) (In French).
NSA 9, 6090 (55); SA A58, 7095 (55); and CA 50, 3098a (56).
- 100 Birnbaum, Harth, Seren, and Tobin
Determining betatron energy by activity ratios. *Nucleonics* 13, No. 4, 64-6 (1955).
NSA 9, 3990 (55) and SA A58, 7998 (55).
- 101 Birnbaum, Harth, Seren, and Tobin
An activity-ratio method for measuring the energy stability of betatrons. *Phys. Rev.* 89, 897 (1953).
CA 48, 8064b (54).
- 102 Georges Boulegue
Use of the betatron in nuclear physics. *J. phys. radium* 16, 872-81 (1955) (In French).
NSA 10, 1937 (56) and SA A59, 1588 (56).
- 103 G. Boulegue and P. Chanson
Problems of regulation and calibration for a 31.8-Mev betatron. *J. phys. radium* 17, 596-7 (1956) (In French).
NSA 10, 10608 (56) and SA A60, 1357 (57).
- 104 Bureau, Austerheim, and Zaffarano
An electron injector for a 70-Mev synchrotron. *Ames. Lab. ISC-490*, 11 p. (1954).
NSA 8, 5373 (54).
- 105 Cole, Jones, Pruett, and Terwilliger
Misalignments in the Michigan radial-sector FFAG accelerator. *Midwestern Univ. Research Assn., Urbana, MURA-203*, 13 p. (1956).
NSA 11, 1674 (57).

- 106 W. Dallenbach
Strong focusing for particle accelerators. *Z. Angew. Phys.* 7, 344-60 (1955). (In German).
SA A58, 8002 (55) and SA B58, 4389 (55).
- 107 W. Dallenbach
Strong focusing for particle accelerators. *Z. Naturforsch.* 9a, 1005-12 (1954) (In German).
SA A58, 4713 (55) and SA B58, 2884 (55).
- 108 R. S. Foote and B. Petree
A pulsed magnetic extractor for removing the electron beam from a betatron. *Rev. Sci. Instr.* 25, 694-8 (1954).
NSA 8, 5729 (54); SA A57, 10240 (54); and SA B57, 4751 (54).
- 109 Kamhara, Imai, Kimura, and Wajima
The 20-Mev betatron. *J. Inst. Elect. Engrs. Japan* 75, 609-16 (1955) (In Japanese).
SA B59, 4285 (56).
- 110 F. S. Kirn and R. J. Kennedy
Betatron x-rays: How much concrete for shielding? *Nucleonics* 12, 44-8 (1954).
SA A57, 9867 (54) and CA 48, 13451b (54).
- 111 H. W. Koch and R. S. Foote
Total-absorption x-ray spectrometry: Application to betatron experiments. *Nucleonics* 12, 51-3 (1954).
SA A57, 6651 (54) and CA 48, 6850e (54).
- 112 A. A. Kolomenskii and A. N. Lebedev
On the influence of radiation in the movement of relativistic electrons in a magnetic field. *Doklady Akad. Nauk S.S.S.R.* 106, 807-10 (1956) (In Russian).
SA A59, 8230 (56).
- 113 A. A. Kolomenskii and A. N. Lebedev
The role of radiational losses in cyclic accelerators. *Soviet Phys. JETP* 3, 946-7 (1957).
NSA 11, 4141 (57).
- 114 Von P. Kunze
Circular accelerators. *Naturwissenschaften* 43, 457-65 (1956).
NSA 11, 2157 (57).
- 115 Laughlin, Ovadis, Beattie, Henderson, Harvey, and Haas
Some physical aspects of electron-beam therapy. *Radiology* 60, 165-85 (1953).
SA A57, 6205 (54).

- 116 Major, Perry, and Phillips
A 20-Mev betatron for x-ray therapy. Proc. Instn. Elect. Engrs.
102A, Paper No. 1886, 845-56 (1955).
SA B59, 339 (56).
- 117 A. N. Matveev
The motion of electrons in cyclic accelerators as a stochastic process.
Doklady Akad. Nauk S.S.S.R. 109, 495-8 (1956) (In Russian).
SA A60, 1365 (57).
- 118 Moller, Grimm, and Weeber
Tests of the capacity of a 31-Mev betatron in the irradiation of steel.
Arch. Eisenhüttenw. 25, 279-91 (1954).
CA 48, 11204f (1954).
- 119 V. A. Moskalev
The stereobetatron. Zhur. Tekh. Fiz. 25, 2060-1 (1956) (In Russian).
SA A60, 4438 (57).
- 120 V. A. Moskalev
Spatial distribution of betatron radiation at 10 Mev. Zhur. Tekh.
Fiz. 26, 2595-8 (1956) (In Russian).
SA A60, 4461 (57).
- 121 National Bureau of Standards
Protection against betatron-synchrotron radiations up to 100 million
electron volts. National Bureau of Standards Handbook No. 55 (1955),
52 p., United States Department of Commerce, Washington D. C.
CA 50, 3118c (56).
- 122 K. Phillips
An apparatus for the accurate control of the peak x-ray energy of a
20-Mev betatron. Brit. J. Appl. Phys. 7, 129-36 (1956).
NSA 10, 8697 (56); SA A59, 5138 (56); and SA B59, 3382 (56).
- 123 Richardson, Van Roosenbeek, and Morgan
Field localization for betatron therapy. Am. J. Roentgenol. Radium
Therapy Nuclear Med. 76, 934-8 (1956).
NSA 11, 721 (57).
- 124 Dane T. Scag (to Allis-Chalmers Mfg. Co.)
Lead-pellet absorptive shield for betatrons. U. S. Pat. 2,675,485.
(April 13, 1954).
CA 48, p9236c (1954).
- 125 R. Schittenhelm
A 15-Mev betatron x-ray source for nondestructive testing of materials.
Siemens-Z. 29, 483-9 (1955) (In German).
SA B59, 1160 (56).

- 126 R. Schittenhelm and J. Urlaub
A 15-Mev betatron for the nondestructive testing of materials. IV. Exposure technique and resolution. Arch. tech. Messen. 240 (Ref. v9114-16) 9-12 (1956) (In German).
SA B59, 3926 (56).
- 127 M. Seidl
Orbital accelerators of electrons. Slaboproudý obzor 17, 698-702 (1956) (In Czech).
SA B60, 2985 (57).
- 128 Seren, Birnbaum, Harth, and Tobin
The effect of magnetic flux amplitude on the flux-integrator energy control of a betatron. Phys. Rev. 91, 474 (1953).
CA 49, 10072f (55).
- 129 Č. Šimáně
Elementary theory of accelerators II - III. Elektrotech. obzor. 42, No. 10, 550-7; No. 12, 676-85 (1953) (In Czech)
SA A57, 10260 (54) and SA B57, 4748 (54).
- 130 Skarsgard, Cormack, and Johns
Measurement of the ratio E_m/J_m for betatron radiation. Radiology 68, 257-8 (1957).
NSA 11, 4726 (57).
- 131 B. M. Spicer and A. S. Penfold
Energy stability of the 22-Mev betatron at the University of Illinois. Rev. Sci. Instr. 26, 952-3 (1955).
NSA 10, 420 (56); CA 51, 2411e (57); and SA A59, 396 (56).
- 132 H. Steinwedel
Particle orbits in circular accelerators. European Council for Nuclear Research, CERN-56-20, 50 p. (1956).
NSA 10, 10595 (56).
- 133 Lee C. Teng
Continual injection into circular ion accelerators. Rev. Sci. Instr. 27, 106-7 (1956).
NSA 10, 4960 (56); CA 51, 7882b (57); and SA A59, 5944 (56).
- 134 R. M. Warner, Jr. and E. F. Schrader
Angle-energy distribution of radiation from high-energy electron accelerators. Rev. Sci. Instr. 25, 663-7 (1954).
CA 48, 13448d (1954).
- 135 E. V. Weinstock and J. Halpern
Bremsstrahlung spectrum from the internal target of a 22-Mev betatron. Phys. Rev. 100, 1293-8 (1955).
NSA 10, 2182 (56).

LINEAR ACCELERATORS

- 136 J. H. Adlam
A method of simultaneously focusing and accelerating a beam of protons. Atomic Energy Research Establishment, Harwell, England, AERE-GP/M-146, 27 p. (1953).
NSA 11, 6128 (57).
- 137 Allan, Carey, McCahon, and Poole
The recovery of tritium used in ion accelerators. Atomic Energy Research Establishment, Harwell, England, AERE-N/R-494, 3 p. (1955).
SA A58, 9903 (55).
- 138 Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, Richman, and Woodyard
Berkeley proton linear accelerator. Rev. Sci. Instr. 26, 111-33 (1955).
SA A58, 4732 (55); SA B58, 2526 (55); and CA 49, 12143c (55).
- 139 Atomics 6, 139-43 (1955)
A new linear accelerator for British hospital. A 15-Mev machine for St. Bartholomew's, London.
NSA 9, 4882 (55).
- 140 C. F. Bareford and M. G. Kelliher
The 15-Mev linear electron accelerator for Harwell. A. Choice of parameters and general design. B. Detailed description of main components and circuits. C. Testing and performance. Philips Tech. Rev. 15, 1-26 (1953).
SA 57, 6658 (54).
- 141 J. S. Bell
Linear accelerator phase oscillations. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-114, 12 p. (1954).
NSA 9, 3988 (55) and SA A58, 5450 (55).
- 142 J. S. Bell
Grid-focused linear accelerator dynamics. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-95, 33 p. (1954).
SA A57, 6672 (54).
- 143 M. Bell
Focusing in the proton linear accelerator: II. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-128, 13 p. (1955).
NSA 10, 1075 (56) and CA 50, 3098b (56).
- 144 M. Bell and W. Walkinshaw
Focusing system for the 600-Mev proton linear accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-112, 20 p. (1954).
NSA 9, 1097 (55); SA A58, 6227 (55); and SA A58, 2886 (55).

- 145 Michel-Yves Bernard
Strong focusing in linear ion accelerators. *Ann. phys.* 9, 633-82 (1954).
NSA 9, 2024 (55); SA A58, 1918 (55); and CA 49, 10081e (55).
- 146 Michel-Yves Bernard
Importance of the divergence created by the accelerating slits in a linear ion accelerator. *Compt. rend.* 238, 675-7 (1954); cf CA 48, 459c (54).
CA 48, 6850d (54).
- 147 Michel-Yves Bernard
A simple theoretical model for the study of ion motion in a linear accelerator. *J. phys. radium* 15, 121A-32A (1954). (In French).
NSA 9, 397 (54) and SA A58, 2797 (55).
- 148 Michel-Yves Bernard
Radial focusing of the ion beam in a linear accelerator by charged grids. *Compt. rend.* 240, 1636-8 (1955) (In French).
NSA 9, 4880 (55) and SA A58, 7133 (55).
- 149 F. Bertein and W. Chadid
On the production of slow electromagnetic waves by the use of cylindrical current sheets. *Compt. rend.* 242, 2918-20 (1956) (In French).
SA A59, 7470 (56).
- 150 J. Billing and P. Murray
Fabrication of titania dielectrics for linear accelerators. Atomic Energy Research Establishment, Harwell, England, AERE-M/R-606, 13 p. (1950).
NSA 9, 1096 (55).
- 151 Blackstock, Birkhoff, and Slater
Electron accelerator and high-resolution analyzer. *Rev. Sci. Instr.* 26, 274-5 (1955).
NSA 9, 3665 (55); SA A58, 4716 (55); and SA B58, 2525 (55).
- 152 G. A. Blanc
Determination of possible induced activity in the Mark-I MTA linear accelerator. California Research and Development Co., Livermore Research Lab., LRL-116, 17 p. (1954).
NSA 8, 5374 (54).
- 153 E. Blomsjo and G. F. Von Dardel
A versatile 150-kv neutron generator. *Appl. Sci. Research B* 4, No. 1-2, 49-67 (1954).
SA A57, 19538 (54).

- 154 R. L. F. Boyd and D. Morris
A radiofrequency probe for the mass-spectrometric analysis of ion concentrations. Proc. Phys. Soc. (London) 68A, 1-10 (1955).
CA 49, 6721b (55).
- 155 California, University, Berkeley, Radiation Lab.
MTA quarterly progress report for September, October, and November, 1950. California, Univ., Berkeley, Rad. Lab., UCRL-1137 (Del.), 81 p. (1951).
NSA 11, 4136 (57).
- 156 Wassek Chahid
Shunt resistance of linear accelerators. Compt. rend. 242, 244-7 (1956) (In French).
NSA 10, 4962 (56) and SA B59, 2350 (56).
- 157 Wassek Chahid
Determination of the axial field in an Alvarez linear accelerator. Compt. rend. 239 42-4 (1954).
NSA 8, 5727 (54); SA A57, 11132 (54); and SA B57, 5204 (54).
- 158 Raymond Chastel
A study of photodisintegrations by means of nuclear emulsions. I. Apparatus and preliminary measurements. J. phys. radium 14, 707-16 (1953); cf CA 47, 7924i (1953).
CA 48, 4992d (54).
- 159 Chodorow, Ginzton, Hansen, Kyhl, Neal, and Panofsky
Stanford high-energy linear electron accelerator (Mark III). Rev. Sci. Instr. 26, 134-204 (1955).
NSA 9, 3308 (55); CA 49, 12143d (55); SA A58, 6199 (55); and SA B58, 3370 (55).
- 160 E. L. Chu and E. L. Ginzton
Choice of wavelength and characteristic parameters in the design of linear electron accelerators. Stanford Univ. Microwave Lab., ML-274, 80 p. (1955).
NSA 10, 1079 (56).
- 161 Clark, Jopson, Lamb, Smith, and Van Atta
High-current linear accelerators. California, Univ., Berkeley and Livermore Rad. Labs., UCRL-3057, 5 p. (1955).
NSA 10, 4109 (56).
- 162 S. A. Colgate
Proposed rf buncher for A-12. California, Univ., Berkeley, Rad. Lab., UCRL-1820, 30 p. (1952).
NSA 11, 717 (57).

- 163 R. Combe
The pass band and dispersion of waveguides loaded by circular irises.
Compt. rend. 238, 1697-9 (1954) (In French).
SA A57, 8454 (54).
- 164 R. Combe
Attenuation coefficient of waveguides loaded by circular irises. Compt.
rend. 238, 2063-5 (1954).
SA A57, 10352 (54).
- 165 Conference on physics of high-energy particles.
Conference on physics of high-energy particles. (Tbilisi, S.S.S.R.,
October, 1956). Uspekhi Fiz. Nauk S.S.S.R. 61, 103-28 (1957) (In
Russian).
NSA 11, 6181 (57).
- 166 Bruce Cork
The Bevatron 9.9-Mev proton linear accelerator. California, Univ.,
Berkeley, Rad. Lab., UCRL-2385, 35 p. (1954).
NSA 8, 6563 (54).
- 167 Bruce Cork
Proton linear-accelerator injector for the Bevatron. Rev. Sci. Instr.
26, 210-19 (1955).
SA A58, 4733 (55); SA B58, 2527 (55); and CA 49, 12143h (55).
- 168 Dazey, Nielsen, Robertson, and Sewell
Rf field investigations on the 1/10 scale Mark I cavity. California,
Univ., Berkeley, Rad. Lab., UCRL-1173, 190 p. (1951).
NSA 10, 1584 (56).
- 169 Dewey, Nygard, and Kelliher
Electron linear accelerators for radiation processing. Nucleonics
12, No. 12, 40-1 (1954).
NSA 9, 1369 (55) and CA 49, 10078h (55).
- 170 P. D. Dunn
A traveling-wave magnetron amplifier operating in the cyclotron mode.
Atomic Energy Research Establishment, Harwell, England, AERE-
GP/M-166, 45 p. (1952).
NSA 11, 6129 (57).
- 171 Dunn, Hadden, and Thompson
Nonresonant coupling of resonant cavities. Atomic Energy Research
Establishment, Harwell, England, AERE-GP/R-1692, 21 p. (1956).
CA 51, 5578i (57).
- 172 Electronic Engineering 26, 527-8 (1954)
A 15-Mev linear accelerator for medical use.
NSA 9, 1102 (55)

- 173 Engineer 197, 782-3 (1954)
Gantry-mounted linear accelerator for x-ray therapy. (Also in
Engineering, [London] 177, 694-5 (1954)).
SA B57, 3357 (54)
- 174 European Council for Nuclear Research
Linac focusing by means of a pulsed axial magnetic field. CERN-
PS/HGH-2, 17 p. (1954).
NSA 8, 7151 (54)
- 175 Frelot, Combe, and Feix
A linear accelerator for 2.3-Mev electrons. J. phys. radium 17,
598-9 (1956) (In French).
NSA 10, 10609 (56) and SA A60, 1358 (57)
- 176 C. S. Gardner
Correction for magnet failure by strengthening adjacent magnets in a
solenoidally focused linear accelerator. California Research and
Development Co., Livermore Research Lab., Livermore, Calif.,
LRL-134, 9 p. (1954).
NSA 10, 6428 (56)
- 177 Alper A. Garren
Space charge expansion of ion bunches drifting down a conducting
pipe. California, Univ., Berkeley, Rad. Lab., UCRL-1394, 15 p.
(1951).
NSA 10, 10981 (56)
- 178 Myron L. Good
Phase-reversal focusing in linear accelerators. Phys. Rev. 92,
538 (1953).
CA 49, 10073f (55)
- 179 M. Good and L. Smith
Limitations on bore, entering beam, and voltage gradients in the strong-
focusing linear accelerator. California, Univ., Berkeley, Rad. Lab.,
UCRL-2203, 2 p. (1943).
NSA 10, 5413 (56)
- 180 M. Good and L. Smith
Limitations on bore, entering beam and voltage gradients in the
strong-focusing linear accelerator. Part II. California, Univ.,
Berkeley, Rad. Lab., UCRL-2246, 5 p. (1953).
NSA 10, 5413 (56)
- 181 P. Grivet
A linear electron accelerator for medical applications. Ann. Radio-
élect. 9, 37-43 (1954) (In French).
SA A57, 11109 (54) and SA B58, 356 (55)

- 182 C. L. Hsieh
The stray radiation levels of a 45-Mev traveling-wave linear electron accelerator. Brit. J. Radiol. 29, 201-4 (1956).
NSA 10, 8019 (56)
- 183 C. L. Hsieh
45-Mev medical linear electron accelerator. Elect. Eng. 74, 790-5 (1955).
SA B59, 785 (56)
- 184 C. L. Hsieh and E. M. Uhlmann
Experimental evaluation of the physical characteristics of a 45-Mev medical linear electron accelerator. Radiology 67, 263-72 (1956).
NSA 10, 11543 (56) and SA A60, 1556 (57)
- 185 I. Jacobs and E. S. Akeley
Transverse motion of an electron in a constant wave-speed section of a linear accelerator. J. Appl. Phys. 25, 572-6 (1954).
SA A57, 7482 (54)
- 186 M. R. Jeppson and R. F. Post
High-power electron linear accelerators for industry and research. Proc. Conf. Nuclear Eng. 1955, C15-C20 (1955).
CA 49, 15516b (55)
- 187 Kjell Johnsen
Theoretical losses in a helix with shield and support. European Council for Nuclear Research, CERN-PS/KJ-27, 22 p. (1954).
NSA 8, 6561 (54)
- 188 Kjell Johnsen
The effect of misalignments of focusing lenses in a linac. European Council for Nuclear Research, CERN-PS/KJ-28, 13 p. (1955).
NSA 9, 6493 (55)
- 189 Kjell Johnsen
The "debuncher": A device for reducing the energy spread of a linac. European Council for Nuclear Research, CERN-PS/KJ-29, 12 p. (1955).
NSA 9, 7164 (55)
- 190 L. H. Johnston and S. Schuldt
Adiabatic damping of large-amplitude phase oscillations in a linear accelerator. Minnesota, Univ., and Midwestern Universities Research Assn., Urbana, Ill., MURA-LHJ/ss-1, 26 p. (1956?).
NSA 10, 6000 (56)
- 191 Johnston, Day, and Williams
Proposed design of a 50-Mev proton linear accelerator. Phys. Rev. 95, 599 (1954).
CA 50, 10543h (56)

- 192 I. Kaufman
Theoretical and experimental evaluation of the Rebatron-a relativistic electron-bunching accelerator. Illinois, Univ., Urbana, Electrical Engineering Research Lab. Project Report, 330 p. (1956).
NSA 11, 5053 (57)
- 193 Kimura, Kumabe, Nakatsu, Ueyanagi, and Kusumegi
Trial manufacture of an electron accelerator. Bull. Inst. Chem. Research, Kyoto Univ. 23, 56 (1950).
CA 48, 6272b (54)
- 194 Kimura, Sakisaka, and Miyashiro
Accelerating tube for neutron production. Bull. Inst. Chem. Research, Kyoto Univ. 29, 67-8 (1952).
CA 48, 8663d (54)
- 195 N. M. King
Proton dynamics in the linear accelerator. I. Grid-focused section. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-107, 12 p. (1954).
NSA 8, 7150 (54)
- 196 N. M. King
Proton dynamics in the linear accelerators. II. A/G-focused section, 10-50 Mev. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-118, 37 p. (1954).
NSA 9, 5161 (55) and SA A59, 412 (56)
- 197 N. M. King
Random errors and misalignments in the A/G (alternating-gradient) proton linear accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-126, 24 p. (1955).
SA A58, 9706 (55)
- 198 King, Hobbs, and Harrison
Trajectories in the accelerating and drift spaces of a proton injector. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1748, 5 p. (1955).
CA 50, 7607b (56)
- 199 Kitchen, Schelberg, Hill, and Smits
Cavity design data for high-energy linear accelerators. U. S. Atomic Energy Commission AECD-3589, 3-38 (1953).
CA 48, 10442a (1954)
- 200 R. L. Kyhl
A study of multi-Bev linear electron accelerators. Microwave Lab., Stanford Univ., Calif., ML-240, 31 p. (1954).
NSA 9, 772 (55)

- 201 Louis H. La Forge, Jr.
Application of ceramic sections in high-power pulsed klystrons. *Am. Ceram. Soc. Bull.* 35, 117-22 (1956).
NSA 10, 9640 (56)
- 202 Lapitskii, Levintov, Slivkov, and Shamshev
Focusing system of an ion acceleration tube. *Zhur. Tekh. Fiz.* 26, 733-9 (1956) (In Russian).
NSA 10, 7026 (56) and CA 50, 14373d (56)
- 203 Leuba, Salin, Thibaud, and Verzaux
The 1-million-volt particle accelerator at Lyons, used as a neutron generator. *Compt. rend.* 240, 2308-10 (1955).
CA 49, 14495i (55) and SA A58, 8244 (55)
- 204 B. G. Loach
Vacuum equipment for the 4-Mev linear electron accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-EL/R 229, 18 p. (1949).
CA 50, 14382f (56)
- 205 D. Luffman
Proton acceleration with electron bunches. Atomic Energy Research Establishment, Harwell, England, AERE-G/M-126, 21 p. (1952).
NSA 11, 6127 (57)
- 206 Kenneth B. Mallory
A comparison of the predicted and observed performance of a billion-volt electron accelerator (thesis). Stanford Univ., Calif., High-Energy Physics Lab., HEPL-46, 168 p. (1955).
NSA 9, 5165 (55)
- 207 J. F. Marshall and M. A. Pomerantz
Development of a linear electron accelerator and application to solid-state problems. Final report. Bartol Research Foundation, Franklin Inst., NP-5579, 22p. (1955).
NSA 9, 3989 (55)
- 208 R. L. McKisson
Fraction of total beam current as a function of A-12 beam radius. California Research and Development Co., Livermore AECD-4005, 6 p. (1951).
NSA 10, 6427 (56)
- 209 Millar, Firth, and Chick
A versatile top-terminal equipment for an electrostatic generator. *J. Sci. Instr.* 32, 120-1 (1955).
SA A58, 5453 (55)

- 210 C. W. Miller
The design of linear accelerators for x-ray therapy. *Atomics* 5, 254-9 (1954).
NSA 8, 6845 (54).
- 211 C. W. Miller
An 8-Mev linear accelerator for x-ray therapy. *Proc. Inst. Elec. Engrs. I*, 101, 207-22 (54).
SA B57, 3796 (54)
- 212 C. W. Miller
Linear acceleration of charged particles to high energies. Direct and indirect accelerators. *Engineering* 180, 340-3 (1955).
CA 50, 67i (56)
- 213 C. W. Miller
Linear acceleration of charged particles to high energies. Electron accelerators, industrial and medical applications. *Engineering* 180, 374-7 (1955).
CA 50, 67i (56)
- 214 C. W. Miller
Industrial radiography and the linear accelerator. *Metropolitan-Vickers Gaz.* 25, 468-78 (1944).
CA 49, 6735d (55)
- 215 C. W. Miller
Industrial radiography and the linear accelerator. *J. Brit. Inst. Radio Engrs.* 14, 361-75 (1954).
SA B58, 2155 (55)
- 216 L. B. Mullett
Statistical analysis of optical alignment in a linear accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-GP/M-170, 10 p. (1954).
NSA 9, 4878 (55) and SA A58, 5451 (55)
- 217 L. B. Mullett
Traveling-wave systems with different particle and wave velocities. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1742, 11 p. (1955).
NSA 10, 1582 (56)
- 218 L. B. Mullett and J. R. Day
Grids for a proton linear accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-GP/M-149, 5 p. (1953).
NSA 8, 7148 (54)

- 219 Craig S. Nunan
Full-scale 48-Mc cavity for sparking tests of gaps corresponding to 0.45- to 4.5-Mev beam energy. California, Univ., Berkeley, Rad. Lab., UCRL-2229, 10 p. (1953).
NSA 11, 2745 (57)
- 220 Old, Steinhaus, and Wright
Precision cell measurements for the MTA A-54 linear accelerator. California Research and Development Co., Livermore Research Lab., LRL-130, 20 p. (1954).
NSA 8, 6842 (54)
- 221 F. Ollendorff
On the radiation-induced acceleration of elementary electric particles. Bull. Res. Council Israel 3, 348-58 (1954).
SA A58, 2798 (55)
- 222 W. K. H. Panofsky, and J. A. McIntyre
Achromatic beam translation systems for use with the linear accelerator. Rev. Sci. Instr. 25, 287-90 (1954).
SA A57, 6674 (54); SA B57, 2961 (54); and CA 48, 13448h (54)
- 223 M. Papoular
Improvement in performance of a linear accelerator by bunching the electrons before injection. Compt. rend. 238, 789-91 (1954) (In French).
SA A57, 8332 (54) and SA B57, 3794 (54)
- 224 M. Papoular
Construction of a linear electron accelerator with prebunching. Compt. rend. 238, 1115-17 (1954) (In French).
SA A57, 8333 (54) and SA B57, 3795 (54)
- 225 E. Picard
The electron linear accelerator of the C.E.N. at Saclay. J. phys. radium 17, 600-1 (1956) (In French).
NSA 10, 10610 (56) and SA A60, 1359 (57)
- 226 T. G. Pickavance
Proton linear accelerators for nuclear research and the A.E.R.E. 600-Mev project. Nuovo cimento (10) 2, Suppl. 1, 413-22 (1955).
NSA 10, 414 (56) and SA A59, 1297 (56)
- 227 T. G. Pickavance
Proton linear accelerators for nuclear research. Ned. Tijdschr. Natuurk. 21, 201-9 (1955).
NSA 10, 418 (56)

- 228 J. M. Ponce de Leon
Design of the bunching section of the Stanford Mark IV linear
accelerator. Stanford Univ., Microwave Lab., AECU-3046, 77 p.
(1955).
NSA 10, 406 (56)
- 229 M. J. Poole
Delayed neutrons from the booster. Atomic Energy Research Estab-
lishment, Harwell, England, AERE-N/M-70, 6 p. (1954).
NSA 10, 10593 (56)
- 230 R. F. Post and N. S. Shiren
Stanford Mark II linear accelerator. Rev. Sci. Instr. 26, 205-9
(1955).
SA A58, 4715 (55); SA B58, 2524 (55); and CA 49, 12143d (55)
- 231 Post, Shiren, and Brown
The Stanford Mark II linear accelerator. Stanford Univ., High-
Energy Physics Lab., W. W. Hansen Lab. of Physics, HEPL-11,
17 p. (1954).
NSA 8, 5043 (54)
- 232 Jaques Pottier
A cavity accelerator. Nuovo cimento (10) 1, 949-52 (1955) (In French).
NSA 9, 5171 (55); SA A58, 7999 (55); and SA B58, 3820 (55)
- 233 Jaques Pottier
On focusing of the beam in a stationary-wave accelerator. Compt.
rend. 238, 1795-7 (1954) (In French).
NSA 8, 4427 (54) and SA A57, 8352 (54)
- 234 R. O. Ridley
Proton orbits for an electrostatically strong-focused 0.5 to 5 Mev
linear accelerator: 600 Mev proton linear accelerator. Atomic
Energy Research Establishment, Harwell England, AERE-T/M-103,
6 plus xii pp. (1954).
SA A57, 11128, (54)
- 235 J. Rotblat
The 15-Mev linear accelerator at St. Bartholomew's hospital. Nature
175, 745-7 (1955).
NSA 9, 4881 (55) and SA B58, 3369 (55)
- 236 G. Saxon
Theory of electron-beam loading in linear accelerators. Proc. Phys.
Soc. (London) B67, 705-16 (1954).
NSA 8, 7153 (54); SA A57, 11108 (54); and SA B57, 5203 (54)

- 237 Albert Septier
Phase velocity and shunt impedance of a helical wave guide for a proton linear accelerator (energy about 50 Mev). Compt. rend. 240, 2500-2 (1955) (In French).
NSA 9, 6499 (55) and SA B58, 4857 (55)
- 238 Albert Septier
Experimental study of a helical guide for a proton linear accelerator: shunt impedance. Compt. rend. 239, 1476-8 (1954) (In French).
NSA 9, 1373 (54); SA A58, 1916 (55); and SA B58, 1179 (56)
- 239 Albert Septier
Experimental study of a helical wave guide for a heavy-particle linear accelerator: phase velocity. Compt. rend. 239, 1367-9 (1954).
NSA 9, 1372 (55); SA A58, 1916 (55); and SA B58, 1178 (55)
- 240 Albert Septier
Determination of the series impedance and of the attenuation length of a helical wave guide for a linear proton accelerator. Compt. rend. 243, 1748-50 (1956).
NSA 11, 2156 (57) and CA 51, 4159b (57)
- 241 R. Servranckx
A helical waveguide for accelerating protons from 1 Mev to 10 Mev. Bull. classe sci., Acad. roy. Belg. 40, 167-8 (1954) (In French).
SA A57, 8356 (54) and CA 48, 11943e (54)
- 242 R. Servranckx
A helical waveguide for accelerating protons from 1 to 10 Mev. Bull. classe sci., Acad. roy. Belg. 41, 474-85 (1955) (In French).
NSA 9, 6498 (55) and SA A58, 8023 (55)
- 243 R. B. Shersby-Harvie
Linear accelerators using the principle of Sloan and Lawrence. Atomic Energy Research Establishment, Harwell, England, AERE-GP/M-156, 6 p. (1953).
NSA 11, 5632 (57)
- 244 Shersby-Harvie, Mullett, Walkinshaw, Bell, and Loach
A theoretical and experimental investigation of anisotropic-dielectric-loaded linear electron accelerator. Proc. Inst. Elec. Engrs. (London) 103, Paper No. 2127M, 18 p. (1956).
SA B59, 3927 (56)
- 245 Shersby-Harvie, Mullett, Walkinshaw, Bell, and Loach
A theoretical and experimental investigation of anisotropic-dielectric-loaded linear electron accelerators. Proc. Inst. Elec. Engrs. (London) 104B, Paper 2127M, 273-92 (1956).
SA B60, 3679 (57)

- 246 Skaggs, Nygard, and Lanzl
Design and initial operation of a 50-Mev microwave linear accelerator for electron therapy. *Radiology* 64, 117 (1955).
NSA 9, 2025 (55)
- 247 Erik A. Smårs
Electron orbits in the buncher of a linear accelerator. *Microwave Lab., Stanford Univ., Calif., AECU-2995*, 24 p. (1954).
NSA 9, 3660 (55)
- 248 Erik A Smårs
Prebunching γ -velocity modulation in linear accelerators. *Stanford Univ., Calif., AECU-3198*, 24 p. (1956).
NSA 11, 1354 (57)
- 249 L. Smith and R. L. Gluckstern
Focusing in linear ion accelerators. *California, Univ., Berkeley, Rad. Lab., UCRL-2795*, 30 p. (1954).
NSA 9, 2465 (55); CA 49, 12143e (55); SA A58, 4734 (55); and SA B58, 2528 (55)
- 250 L. Smith and R. L. Gluckstern
Focusing in linear ion accelerators. *Rev. Sci. Instr.* 26, 220 (1955).
G. B.
- 251 J. Sommeria-Klein
Construction of a 700 kv ion-accelerator tube. Development of oscillating-electron ion sources. *Ann. phys.* (13) 1, 344-94 (1956) (In French).
NSA 10, 9641 (56); SA A59, 6716 (56); and CA 51, 877e (57)
- 252 O. Specchio and A. Cambieri
A 560-e.k.v. particle accelerator. *Rend. ist. lombardo sci., Pt. I, Classe sci. mat. e nat.* 90, 14-22 (1956).
CA 51, 877d (57)
- 253 Stanford University
Development of a 6-Mev linear accelerator for medical and radiographical applications. Status report for March 1-May 31, 1952. *Stanford University, Calif., ML-166* (1952).
NSA 8, 4424 (54)
- 254 Stanford University
Development of a 6-Mev linear accelerator for medical and radiographical applications. Status report for June 1-August 31, 1952. *Stanford University, Calif., ML-167* (1952).
NSA 8, 4425 (54)
- 255 Warren F. Stubbins
An alternating-gradient channel using permanent bar magnets. *California, Univ., Berkeley, Rad. Lab., UCRL-2708*, 21 p. (1954).
NSA 9, 395 (55)

- 256 Warren F. Stubbins
Alternating-gradient channel using permanent bar magnets. Rev. Sci. Instr. 26, 666-71 (1955).
SA B58, 3814 (55)
- 257 L. C. Teng
Alternating-gradient electrostatic focusing for linear accelerators. Rev. Sci. Instr. 25, 264-7 (1954).
CA 48, 13448g (54); SA A57, 6673 (54); and SA B57, 2960 (54)
- 258 Thibaud, Verzaux, and Salin
First results obtained with the 1-Mev particle accelerator installed at Lyon. Compt. rend. 239, 1483-5 (1954) (In French).
NSA 9, 1374 (55); SA A58, 1911 (55); and CA 49, 4415i (55)
- 259 E. M. Uhlman and C. L. Hsieh
Some physical characteristics of a 45-Mev linear electron accelerator for therapeutic applications. Radiology 64, 587 (1955).
SA A58, 7096 (55) and SA B58, 3819 (55)
- 260 R. K. Wakerling
Summary of the research progress meeting. California, Univ., Berkeley, Rad. Lab., RL-28.5.114, 5 p. (1946).
NSA 10, 2547 (56)
- 261 W. Walkinshaw and M. Ross
Note on prebuncher for proton linear accelerator. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-66, 10 p. (1952).
NSA 8, 7149 (54)
- 262 Walkinshaw, Sabel, and Outram
Shunt impedance calculations for proton linear accelerators, Part 1. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-104, 21 p. (1954).
NSA 8, 5725 (54) and SA A57, 11129 (54)
- 263 Walkinshaw, Sabel, and Outram
Shunt impedance calculations for proton linear accelerators, Part 2. Atomic Energy Research Establishment, Harwell, England, AERE-T/M-105, 13 p. (1954).
NSA 8, 5726 (54) and SA A57, 11130 (54)
- 264 Robert A. Weir
Radiofrequency power losses compared for four linear accelerator configurations. California, Univ., Berkeley, Rad. Lab., UCRL-3150, 16 p. (1955).
NSA 10, 1586 (56)

265 J. J. Wilkins
Design notes on resonators for proton linear accelerators. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1613, 27 p. (1955).
NSA 10, 1074 (56); CA 49, 12141d (55); SA A59, 415 (56); and SA B59, 289 (56)

266 O. Yonts and S. Bashkin
A 100-kev positive-ion accelerator. Phys. Rev. 87, 175 (1952).
CA 48, 8061b (54)

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267 J. B. Adams
Acceleration of nuclear particles in curved paths. Cyclotron, synchrocyclotron and synchrotron (a review). Engineering 180, 530-5 (1955).
CA 50, 67h (56)

268 F. Amman and L. Dadda
Design of the pole faces for circular particle accelerators with the electrolytic tank. Nuovo cimento (10) 3, 184-7 (1956).
NSA 10, 7023 (56) and SA A59, 3783 (56)

269 F. A. Aschenbrenner
Particle selection technique used at the Massachusetts Institute of Technology cyclotron. Phys. Rev. 95, 600 (1954).
CA 50, 10543h (56)

270 Hugo Atterling
Acceleration of heavy ions in the 225-cm cyclotron at the Nobel Institute of Physics. Preliminary note. Arkiv Fysik 7, 503-506 (1954).
NSA 8, 4730 (54); SA A57, 8351 (54); and CA 48, 11943d (1954)

271 Bach, Childs, Hockney, Hough, and Parkinson
Cyclotron instrumentation for nuclear spectroscopy at medium resolution in energy. Rev. Sci. Instr. 27, 516-26 (1956).
NSA 10, 11539 (56) and SA A59, 7473 (56)

272 A. Bariaud
High-frequency circuits of the cyclotron. L'Onde Électrique 35, 1052-63 (1955).
NSA 11, 729 (57)

273 Stewart D. Bloom
A new technique for observing cyclotron phase grouping. Phys. Rev. 98, 233 (1955).
CA 50, 10548a (56)

- 274 Bluemel, Carroll, and Stahelin
Investigation of the field modulation produced by flat spiral shims in a cyclotron magnet. University of Illinois (Urbana) Technical Report No. 2, 27 p. (1956).
NSA 11, 5052 (57)
- 275 A. L. Boch and E. D. Hudson
Cyclotron efficiency and power-distribution measurements. Phys. Rev. 91, 224 (1953).
CA 49, T0069h (55)
- 276 E. Brannen and H. I. S. Ferguson
Beam extraction in the microtron. Rev. Sci. Instr. 27, 833-4 (1956).
SA A60, 1360 (57)
- 277 D. A. Bromley and J. A. Bruner
The design of a focusing and analyzing system for the 27" cyclotron beam. Rochester Univ. Report NYO-3823, 50 p. (1954).
NSA 9, 394 (55)
- 278 J. J. Burgerjon
New deuterium supply for cyclotron ion sources. Rev. Sci. Instr. 25, 522-3 (1954).
NSA 8, 4429 (54) and CA 48, 13448a (54)
- 279 Calame, Cooper, Engelsberg, Gerstein, Koehler, Kuckes, Meadows, Strauch, and Wilson
Some features of regenerative deflection and their application to the Harvard synchrocyclotron. Nuclear Instr. 1, 169 (1957).
G. B.
- 280 California, University, Radiation Laboratory
Index to information available on the Crocker 60-inch cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-1651 (2nd rev.), 12 p. (1954).
NSA 9, 773 (54)
- 281 Caro, Martin, and Rouse
A variable-energy cyclotron. Austral. J. Phys. 8, 306-9 (1955).
SA A59, 416 (56) and SA B59, 331 (56)
- 282 M. Clark
Shielding of a high-current cyclotron and a Van de Graaff machine. U. S. Atomic Energy Comm. Rept. BNL-227, 1-16 (1952).
CA 48, 10441c (54)
- 283 Bernard L. Cohen
Theory of phase-compensated fixed-frequency cyclotrons. Oak Ridge Nat'l. Lab., Y-12 area, Tenn., Y760, 16 p. (1951).
NSA 10, 6430 (56)

- 284 Bernard L. Cohen
Theory of fixed-frequency cyclotrons. *Rev. Sci. Instr.* 24, 59-601 (1953).
CA 48, 9821d (54)
- 285 S. A. Colgate and A. J. Schwemin
Spiral-beam accelerator-model results. California, Univ., Berkeley, Rad. Lab., UCRL-2297, 27 p. (1953).
NSA 10, 10982 (56)
- 286 William F. Coombs, Jr.
A study of the neutron hazard at the 130" synchrocyclotron (thesis). Rochester N. Y. Univ., NYO-7592, 56 p. (1956).
NSA 10, 4108 (56)
- 287 Frank S. Crawford, Jr.
Destruction of stored cyclotron beam by coulomb scattering. California, Univ., Berkeley, Rad. Lab., UCRL-3464, 18 p. (1956).
NSA 10, 10600 (56) and CA 51, 878a (57)
- 288 F. S. Crawford, Jr. and W. F. Stubbins
Beam storage in the 184-inch cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-3463, 34 p. (1956).
NSA 10, 11538 (56)
- 289 A. V. Crewe and K. J. Le Couteur
Extracted proton beam of the Liverpool 156-inch cyclotron. *Rev. Sci. Instr.* 26, 725 (1955).
NSA 9, 6497 (55); CA 50, 16423h (56); and SA A59, 411 (56)
- 290 A. V. Crewe and J. W. G. Gregory
The extraction of the beam from the Liverpool synchrocyclotron. II. Experimental work. *Proc. Roy. Soc. A* 232, 242-51 (1955).
SA A58, 9711 (55) and CA 50, 4656b (56)
- 291 A. V. Crewe and U. E. Kurse
Regenerative beam extractions in the Chicago synchrocyclotron. *Rev. Sci. Instr.* 27, 5-8 (1956).
CA 51, 7171a (57) and SA A59, 2186 (56)
- 292 P. Debraine
The C. E. A. cyclotron at Saclay. *L'Onde Electrique* 35, 1048-51 (1955) (In French).
NSA 11, 728 (57)
- 293 Debraine, Lazanski, and Boyadjian
The design of the CERN synchrocyclotron control system. European Council for Nuclear Research, CERN-56-1, 46 p. (1956).
NSA 10, 7012 (56)

- 294 Delbecq, Ramler, Rocklin, and Yuster
Crystal technique for measuring cyclotron beam energies. Rev. Sci. Instr. 26, 543-6 (1955).
NSA 9, 5786 (55) and SA A58, 8027 (55)
- 295 C. E. Dixon and D. B. Bowen
Radiation ordering by cyclotron particles. Phys. Rev. 94, 1418 (1954).
CA 49, 10078f (55)
- 296 M. R. Donaldson
An approximate method for obtaining the VSW on cyclotron dees. IRE Trans. Nuclear Sci. NS-3, No. 2, 1-4 (1956).
NSA 10, 9643 (1956) and SA B60, 3675 (57)
- 297 Donaldson, Worsham, and Ziegler
A study of a variable frequency cyclotron resonant system. IRE Convention Record 3, Part 10, 191-8 (1955)
NSA 9, 7945 (55)
- 298 Dzheleпов, Dmitrievsky, Katyshev, Kozodaev, Mescheryakov, Tarakanov, and Chestnoi
High-energy particles from the six-meter synchrocyclotron and their utilization. Soviet J. Atomic Energy 4, 459-67 (1956).
NSA 11, 5643 (57)
- 299 A. O. Edmunds and F. Uridge
An electrostatic focusing device for use with the Harwell f.m. cyclotron. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1246, 11 p. (1953).
NSA 11, 4135 (57)
- 300 K. E. A. Effot and J. H. Fremlin
A circulation system for ³He. J. Sci. Instr. 32, 363-4 (1955).
SA A58, 9708 (55)
- 301 Efremov, Mescheryakov, Mints, Dzheleпов, Ivanov, Katyshev, Komar, Malyshev, Monoszon, Nevyaszhsy, Polyakov, and Chestnoi
The six-meter synchrocyclotron of the Institute of Nuclear Problems, Academy of Sciences, U.S.S.R. Soviet J. Atomic Energy 4, 449-57 (1956).
NSA 11, 5642 (57)
- 302 E. Fawcett
Cyclotron resonance in tin and copper. Phys. Rev. 103, 1582-3 (1956).
CA 50, 16363h (56)

- 303 J. H. Fremlin and V. M. Spiers
The break-up of negative ions in the cyclotron. Proc. Phys. Soc. (London) A68, 398-403 (1955).
NSA 9, 4879(55) and CA 49, 13794e (55)
- 304 Fulbright, Bromley, Bruner, Hawrylak, and Hamann
Preliminary report on the new 8-Mev variable-energy cyclotron of the University of Rochester. Rochester, Univ., NYO-6541, 6 p. (1954).
NSA 9, 1653 (55)
- 305 Gallop, Vonberg, Post, Powell, Sharp, and Waterton
A cyclotron for medical research. Proc. Inst. Elec. Engrs. (London) 104B, Paper 2342M, 12 p. (1957).
SA B60, 2237 (57)
- 306 Galt, Yager, and Dail
Cyclotron resonance effects in graphite. Phys. Rev. 103, 1586-7 (1956).
CA 50, 16363g (56)
- 307 W. S. Gilbert and A. Andrew
The use of cyclotron irradiation in the study of radiation effects on materials; techniques developed since 1948. Atomics International Div., North American Aviation, Inc., Canoga Park, Calif., NAA-SR-1477, 16 p. (1956).
NSA 10, 3322 (56)
- 308 W. S. Gilbert and J. H. Pepper
Some experimental facilities and techniques used at the Berkeley 60-inch cyclotron for irradiation-effect studies. Phys. Rev. 96, 862 (1954).
CA 50, 10547f (56)
- 309 L. Gillon and Y. Hecq
Thyratron control of the direct current supply of a 100-kw cyclotron amplifier. Ann. soc. sci. Bruxelles, Ser. 1, 67, 318-26 (1953) (In French).
NSA 9, 2925 (55) and SA B57, 2779 (54)
- 310 Farno L. Green
Electromagnetic shims for focusing in a fixed-frequency cyclotron. Phys. Rev. 91, 223-4 (1953).
CA 49, 10069h (55)
- 311 Farno L. Green
Proton beam study in a fixed-frequency cyclotron. I.R.E. Trans. Nuclear Sci. NS-3, No. 2, 8-11 (1956).
NSA 10, 9644 (56) and SA B60, 3676 (57)

- 312 Guseva, Filippova, Gerlit, Druin, Myasoedov, and Tarantin.
Experiments on the production of einsteinium and fermium with a
cyclotron. *J. Nuclear Energy* 3, 341-6 (1956).
CA 51, 7184h (57)
- 313 H. J. Hausman
Development of the modified Ohio State University cyclotron. Final
report. Part 2. Ohio State Univ., Research Foundation, AECU-2907,
8 p. (1954).
NSA 8, 5041 (54)
- 314 Bengt Hedin
Design of CERN synchrocyclotron magnet. European Council for
Nuclear Research, Synchrocyclotron Div., Geneva, CERN-55-3,
33 p. (1955).
NSA 9, 3306 (55)
- 315 Heusinkveld, Jakobson, Ruby, and Wright
A report on the three-dee, three-phase 20-inch cyclotron. California,
Univ., Berkeley, Rad. Lab., UCRL-1889 (Rev.) 45 p. (1955).
NSA 9, 6778 (55)
- 316 Heusinkveld, Jakobson, Ruby, Smith, and Wright
Studies with a three-dee, three-phase proton cyclotron. California,
Univ., Berkeley, Rad. Lab., UCRL-3187, 15 p. (1955).
NSA 10, 1587 (56)
- 317 F. T. Howard, Ed.
Electronuclear research division semiannual progress report for
period ending March 20, 1956. Oak Ridge Nat'l. Lab., ORNL-2139,
23 p. (1956).
NSA 10, 12062 (56)
- 318 E. L. Hubbard and E. L. Kelly
Alternating-gradient focusing of a cyclotron external beam. *Rev. Sci.
Instr.* 25, 737-9 (1954).
SA A57, 10263 (54); SA B57, 4750 (54); and CA 48, 13447i (54)
- 319 M. J. Jakobson and J. H. Manley
Phase properties of the deflected ion beam from a fixed-frequency
cyclotron. *Phys. Rev.* 95, 600 (1954).
CA 50, 10543i (56)
- 320 M. J. Jakobson and F. H. Schmidt
Characteristics of a proposed double-mode cyclotron. *Phys. Rev.*
93, 303-5 (1954).
CA 48, 6271c (54)
- 321 Jakobson, Heusinkveld, and Ruby
Modes of acceleration of ions in a three-dee cyclotron. *Phys. Rev.*
104, 362-5 (1956).
NSA 11, 1361 (57); CA 51, 4159g (57); and SA A60, 1382 (57)

- 322 Louis K. Jensen
A timing circuit for the U.C.L.A. fm cyclotron. California, Univ.,
Los Angeles, AECU-3145, 8 p. (1956).
NSA 10, 3044 (56)
- 323 Lawrence W. Jones
The Ohkawa intersecting-beams machine. Michigan, Univ., Ann
Arbor and Midwestern Universities Research Assn., Urbana, Ill.,
MURA-LWJ-12, 10 p. (1956).
NSA 10, 10596 (56)
- 324 Royce J. Jones
The Oak Ridge 44-inch cyclotron. Phys. Rev. 91, 223 (1953).
CA 49, 10069h (55)
- 325 Jones, Terwilliger, and Haxby
Experimental test of the fixed-field alternating-gradient principle of
particle-accelerator design. Rev. Sci. Instr. 27, 651-2 (1956).
NSA 10, 11541 (56) and SA A60, 446 (57)
- 326 H. F. Kaiser
An electron cyclotron (microtron) for 3-cm rf operation. Phys. Rev.
87, 183 (1952).
CA 48, 8061e (54)
- 327 H. F. Kaiser
Microtron resonators. J. Franklin Inst. 259, 25-46 (1955).
SA B58, 2464 (55)
- 328 H. F. Kaiser
The microtron, a nuclear and electronic research instrument. I.R.E.
Trans. Nuclear Sci. NS-3, No. 3, 17-27 (1956).
NSA 10, 9645 (56)
- 329 H. F. Kaiser
Orbital periods in the microtron. Rev. Sci. Instr. 25, 1025-6 (1954).
NSA 9, 396 (55) and SA A58, 979 (55)
- 330 H. F. Kaiser
Microtrons (electron cyclotrons) for x- and k-band operation. J.
Franklin Inst. 257, 89-108 (1954).
SA A57, 7478 (54) and SA B57, 3354 (54)
- 331 H. F. Kaiser
Microtrons (electron cyclotrons for x- and k-band operation) II.
Phys. Rev. 95, 600 (1954).
CA 50, 10543i (56)

- 332 H. F. Kaiser
Relativistic-particle cyclotron with electrostatic focusing. *Phys. Rev.* 91, 499 (1953).
CA 49, 10073c (55)
- 333 H. F. Kaiser and W. T. Mayes
General purpose x-band laboratory microtron with facilities for electron extraction. *Rev. Sci. Instr.* 26, 565-7 (1955).
NSA 9, 5788 (55); SA A58, 8003 (55); and SA B58, 3815 (55)
- 334 I. Kaufman and P. D. Coleman
Electron cyclotron as a source of megavolt electron beams. *J. Appl. Phys.* 27, 1250-1 (1956).
SA A60, 3345 (57)
- 335 Kelly, Pyle, Thornton, Richardson, and Wright
Two electron models of a constant-frequency relativistic cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-3250, 40 p. (1955).
NSA 10, 3240 (56)
- 336 Kelly, Pyle, Thornton, Richardson, and Wright
Two electron models of a constant-frequency relativistic cyclotron. *Rev. Sci. Instr.* 27, 493-503 (1956).
SA A59, 8818 (56) and SA B59, 4564 (56)
- 337 Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh
Osaka University 44-inch cyclotron. *Ann. Rept. Sci. Works, Fac. Sci., Osaka Univ.* 3, 1-24 (1955).
CA 50, 4655i (56)
- 338 E. Kisdi-Koszo
On some problems of the operation of microtrons. *Acta. phys. Hungar.* 4, 377-9 (1955).
SA A58, 8812 (55) and SA B58, 5226 (55)
- 339 J. Kokame and S. Yamashita
Electrostatic deflections of a cyclotron ion beam. *J. Phys. Soc. Japan* 11, 332-3 (1956).
NSA 10, 7021 (56); SA A59, 5156 (56); and CA 50, 9891b (56)
- 340 A. A. Kolomenskii
On elimination of the critical energy in the synchrotron with strong focusing. *Zhur. Tekh. Fiz.* 26, 740-8 (1956) (In Russian).
NSA 10, 7027 (56); SA A60, 469 (57); and CA 50, 14373e (56)

- 341 A. A. Kolomenskii and A. N. Lebedev
The role of radiational losses in cyclic accelerators. Soviet Phys. JETP 3, 946-7 (1957).
NSA 11, 4141 (57)
- 342 Kolomenskii, Pelukhov, and Rabinovich
The ring phasotron, a new accelerator for charged particles. Doklady Akad. Nauk S.S.S.R. 105, 7-12 (1955) (In Russian).
SA A59, 2938 (56) and SA B59, 1506 (56)
- 343 L. Kornblith
Electronic power for a synchrocyclotron. Tele-tech. 13, 98-100, 186-94, 197-8 (1954).
SA B57, 2958 (54)
- 344 L. Kornblith
An rf generator for nuclear energy studies. Electronics 27, 142-5 (1954).
SA B57, 3759 (54)
- 345 Von P. Kunze
Circular accelerators. Naturwissenschaften 43, 457-65 (1956).
NSA 11, 2157 (57)
- 346 Glen R. Lambertson
Use of the wire loop in locating the orbital surface of a cyclotron field. California, Univ., Berkeley, Rad. Lab., UCRL-3366, 9 p. (1956).
NSA 10, 4110 (56)
- 347 K. J. Le Couteur
The extraction of the beam from the Liverpool synchrocyclotron. I. Theoretical. Proc. Roy. Soc. (London) A232, 236-41 (1955).
NSA 10, 1083 (56); CA 50, 4656a (56); and SA A58, 9710 (55)
- 348 K. J. Le Couteur and S. Lipton
Nonlinear regenerative extraction of synchrocyclotron beams. Phil. Mag. (7) 46, 1265-80 (1955).
NSA 10, 2186 (56) and SA A59, 2185 (56)
- 349 Levis, Greer, and Bolton
A 156-inch synchrocyclotron at Liverpool University. Metropolitan-Vickers Gaz. 26, 327-45 (1955).
SA B59, 2347 (56)
- 350 Robert S. Livingston
Trends in cyclotron design. Ind. Eng. Chem. 48, 1231-7 (1956).
NSA 10, 10603 (56) and CA 50, 14373d (56)

- 351 R. S. Livingston and A. Boch
The Oak Ridge 86-inch cyclotron. Oak Ridge National Lab., Tenn.,
ORNL-1196, 145 p. (1956).
NSA 10, 6429 (56)
- 352 R. S. Livingston and R. J. Jones
High-intensity ion source for cyclotrons. Rev. Sci. Instr. 25, 552-
7 (1954).
NSA 8, 4732 (54); SA A57, 10275 (54); and CA 48, 13448h (54)
- 353 R. S. Livingston and R. J. Jones
Design features of a high-current cyclotron. Phys. Rev. 94, 1436
(1954).
CA 49, 10078f (55)
- 354 Livingston, Howard, and Rudolph
Bibliography of cyclotron literature. Oak Ridge National Lab., Tenn.,
ORNL-2023, 91 p. (1956).
NSA 10, 3954 (56)
- 355 John S. Luce
360° cyclotron. Oak Ridge National Lab., Y-12 Area, Tenn., CF-
53-6-224, 11 p. (1953).
NSA 10, 10977 (56)
- 356 J. H. Manley and M. J. Jakobson
Cyclotron beam energy determination by a time-of-flight method.
Rev. Sci. Instr. 25, 368-9 (1954).
NSA 8, 3874 (54); CA 48, 9821f (54); and SA A57, 7498 (54)
- 357 D. E. Mapother and F. E. L. Witt
Cryostat for cyclotron irradiation at liquid helium temperatures.
Rev. Sci. Instr. 26, 843-6 (1955).
NSA 9, 7947 (55) and SA A58, 9615 (55)
- 358 Marshall, Nedzel, and Marshall
A search for polarization in protons from a 450-Mev synchrocyclotron.
Phys. Rev. 93, 927-8 (1954).
CA 49, 10073g (55)
- 359 J. A. Martin and F. L. Green
Cyclotron target for the irradiation of chemical compounds. Nuclear
Sci. and Eng. 1, 185-90 (1956).
NSA 10, 10604 (56)
- 360 Martin, Livingston, Murray, and Rankin
Radioisotope production rates in a 22-Mev cyclotron. Nucleonics 13,
No. 3, 28-32 (1955).
CA 49, 8710g (55)

- 361 A. N. Matveev
The motion of electrons in cyclic accelerators as a stochastic process. Doklady Akad. Nauk S.S.S.R. 109, 495-8 (1956) (In Russian).
SA A60, 1365 (57)
- 362 M. G. Meshcheryakov
Investigation of nuclear processes at high energies in accelerators. Sessiya. Akad. Nauk S.S.S.R. Mirnomu Ispol' Zovaniyu Atomnoi Energii, Moscow, 1955, 15-28 (In Russian).
CA 50, 69b (56)
- 363 M. G. Meshcheryakov
Accelerator studies of high energy processes. Session of the Academy of Sciences of the U.S.S.R. on the Peaceful Uses of Atomic Energy (1955), 39-59 (In Russian).
NSA 9, 7908 (55)
- 364 M. G. Meshcheryakov
High-energy accelerators in research on nuclear processes. AEC-tr-2435, 14 p. (1955) from p. 15-28 of Conference of the Academy of Sciences of the U.S.S.R. on the Peaceful Uses of Atomic Energy, July 1-5, 1955. Session of the division of physical and mathematical sciences (Translation).
NSA 10, 4111 (56)
- 365 W. Messerschmidt
Atomic transformations with technical equipment. Urania 15, 161-75 (1952).
CA 49, 731d (55)
- 366 M. J. Moore
156-inch cyclotron at Liverpool. Nature 175, 1012-15 (1955).
CA 49, 11427h (55)
- 367 E. M. Moroz
On some processes of electron acceleration in a microtron. Doklady Akad. Nauk S.S.S.R. 106, 986-8 (1956).
NSA 10, 9642 (56) and SA A59, 7455 (56)
- 368 E. M. Moroz
Cyclotron with a sectional magnet. Doklady Akad. Nauk S.S.S.R. 108, 436-9 (1956) (In Russian).
NSA 11, 1359 (57) and SA A60, 4434 (57)
- 369 L. B. Mullett
Phase stability in cyclotrons with the fixed-frequency field law. Atomic Energy Research Establishment, Harwell, England, GP/R 2071, 9 p. (1956).
CA 51, 5579b (57)

- 370 L. B. Mullett
Spiral-ridge cyclotrons with frequency modulation. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-2069, 21 p. (1956).
NSA 11, 4721 (57) and CA 51, 7164i (57)
- 371 Nature 175, 1012-15 (1955)
The 156-inch cyclotron at Liverpool.
NSA 9, 6087 (55)
- 372 Petrovich, Preskitt, and Hamann
Modifications of the oscillator of the Rochester 27-inch variable-energy cyclotron. Rochester, New York, Univ., NYO-7816, 15 p. (1956).
NSA 11, 1675 (57)
- 373 T. G. Pickavance
Synchrocyclotrons and the CERN 600-Mev machine. Nuovo cimento (10) 2, Suppl. 1, 403-12 (1955).
NSA 10, 413 (56); SA A59, 9712 (55); and SA B59, 332 (56)
- 374 W. B. Powell
Improving the characteristics of the cyclotron beam. Nature (London) 177, 1045 (1956).
SA A59, 6717 (56)
- 375 Robert Pyle
An electron-model phase-compensated c-w cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-2344 (Rev.), 85 p. (1955).
NSA 9, 6496 (55)
- 376 Robert Pyle
The second electron-model phase-compensated c-w cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-2435 (Rev.), 52 p. (1955).
NSA 9, 5783 (55)
- 377 H. L. Reynolds and A. Zucker
Cyclotron ion source for the production of N^{3+} ions. Rev. Sci. Instr. 26, 894 (1955).
NSA 9, 7948 (55); SA A59, 423 (56); and CA 51, 877i (57)
- 378 Richard B. Rhody
Fast-neutron dosimetry at Argonne National Laboratory cyclotron. Radiation Research 5, 495-501 (1956).
CA 51, 4169g (57)
- 379 Fred L. Ribe
Equilibrium orbits and betatron oscillations in a sinusoidal Thomas cyclotron. Los Alamos Scientific Laboratory, LA-2097, 18 p. (1956).
NSA 11, 6131 (57)

- 380 G. B. Rossi (to U. S. Atomic Energy Commission)
Cyclotron square-wave rf system. U. S. Patent 2,778,937 issued to
U. S. Atomic Energy Commission Jan. 22, 1957.
NSA 11, 5115 (57)
- 381 Ruby, Heusinkveld, Jakobson, Smith, and Wright
Studies with a three-dee three-phase proton cyclotron. Rev. Sci.
Instr. 27, 490-3 (1956).
NSA 11, 733 (57); SA A59, 7472 (56); and SA B59, 3924 (56)
- 382 Schmidt, Farwell, Henderson, Morgan and Strieb
The University of Washington sixty-inch cyclotron. Rev. Sci. Instr.
25, 499-510 (1954).
CA 48, 13443g (54); SA A57, 10261 (54); and SA B57, 4749 (54)
- 383 Glen Schrank
An energy control for external cyclotron beams. Palmer Physical
Lab., Princeton Univ. NYO-6668, 15 p. (1955).
NSA 9, 2924 (55)
- 384 G. E. Schrank
Energy control for external cyclotron beams. Rev. Sci. Instr. 26,
677-80 (1955).
SA A58, 8028 (55); SA B58, 3621 (55); and CA 50, 16423i (56)
- 385 R. H. Schuler and A. O. Allen
Absolute measurement of cyclotron beam currents for radiation-
chemical studies. Brookhaven National Lab., Upton, N. Y., BNL-
2426, 11 p. (1955).
NSA 9, 6777 (55)
- 386 R. H. Schuler and A. O. Allen
Absolute measurement of cyclotron beam currents for radiation-
chemical studies. Rev. Sci. Instr. 26, 1128-30 (1955).
CA 51, 6372a (57) and SA A59, 2935 (56)
- 387 Shull, MacFarland, and Bretscher
Concentration of a cyclotron beam by strong-focusing lenses. Rev.
Sci. Instr. 25, 364-7 (1954).
NSA 8, 3873 (54); CA 48, 9821e (54); SA A57, 6671 (54); and SA B57,
2957 (54)
- 388 Bob H. Smith
A 90-inch cyclotron with an adjustable-energy external beam.
California, Univ., Berkeley, Rad. Lab., UCRL-2620, 20 p. (1954).
NSA 8, 5963 (54)
- 389 Bob H. Smith
The cloverleaf three-phase radiofrequency system. California, Univ.,
Berkeley, Rad. Lab., UCRL-1884 (Rev.), 39 p. (1955).
NSA 9, 6495 (55)

- 390 Bob H. Smith
A three-phase radiofrequency system for cloverleaf cyclotrons.
California, Univ., Berkeley, Rad. Lab., UCRL-3153, 16 p. (1955).
NSA 10, 1082 (56)
- 391 B. H. Smith and K. R. MacKenzie
Three-phase radiofrequency system for Thomas cyclotrons. Rev.
Sci. Instr. 27, 485-90 (1956).
SA A59, 7471 (56) and SA B59, 3923 (56)
- 392 P. Stahelin
The radial stability of orbits in a spiral-ridge cyclotron. University
of Illinois (Urbana) Technical Report No. 1, 34 p. (1956).
NSA 11, 5051 (57)
- 393 H. Steinwedel
Particle orbits in circular accelerators. European Council for
Nuclear Research, CERN-56-20, 50 p. (1956).
NSA 10, 10595 (56)
- 394 W. J. Stephan
184"-cyclotron deuterium electrolyzer tests. California, Univ.,
Berkeley, Rad. Lab., M-3712, 9 p. (1947).
NSA 10, 3735 (56)
- 395 Warren F. Stubbins
An experimental ion source for the 184-inch cyclotron. California,
Univ., Berkeley, Rad. Lab., UCRL-2698, 39 p. (1955).
NSA 9, 3662 (55)
- 396 Warren F. Stubbins
An experimental ion source for the 184-inch cyclotron. Phys. Rev.
98, 274-5 (1955).
CA 50, 10549d (54)
- 397 Warren F. Stubbins
Extraction of synchrocyclotron beams near the maximum energy.
California, Univ., Berkeley, Rad. Lab., UCRL-3476, 18 p. (1956).
NSA 11, 1358 (57) and CA 51, 2411d (57)
- 398 W. J. Sturm and R. J. Jones
Application of thermocouples to target temperature measurement in
the internal beam of a cyclotron. Rev. Sci. Instr. 25, 3923 (1954).
CA 48, 13447i (54) and SA A57, 6670 (54)
- 399 Symon, Kerst, Jones, Laslett, and Terwilliger
Fixed-field alternating-gradient particle accelerators. Phys. Rev.
103, 1837-59 (1956).
NSA 11, 731 (57); CA 50, 16423f (56); and SA A60, 1382 (57)

- 400 K. R. Symon and A. M. Sessler
Methods of radiofrequency acceleration in fixed-field accelerators with applications to high-current and intersecting-beam accelerators. Wisconsin, Univ., Madison; Ohio State Univ., Columbus; and Midwestern Universities Research Assn., Urbana, Ill., MURA-KRS/AMS-1, 55 p. (1956).
NSA 10, 7015 (56)
- 401 A. E. Taylor
Report on research work with the cyclotron at Gustaf Werner Institute for Nuclear Chemistry in Uppsala during the period from April 1 to April 30, 1953. European Council for Nuclear Research, CERN/T/AET-1, 3 p. (1953).
NSA 9, 2456 (55)
- 402 A. E. Taylor
Report on research work with the cyclotron at Gustaf Werner Institute for Nuclear Chemistry in Uppsala during the period from May 1 to June 15, 1953. European Council for Nuclear Research, CERN/T/AET-2, 2 p. (1953).
NSA 9, 2457 (55)
- 403 A. E. Taylor
Report on research work with the cyclotron at Gustaf Werner Institute for Nuclear Chemistry in Uppsala. European Council for Nuclear Research, CERN/T/AET-3, 1 p. (1953).
NSA 9, 2458 (55)
- 404 A. E. Taylor
Report on research work with the cyclotron at Gustaf Werner Institute for Nuclear Chemistry in Uppsala. European Council for Nuclear Research, CERN/T/AET-4, 1 p. (1953).
NSA 9, 2459 (55)
- 405 A. E. Taylor
Internal beam measurements and the deflection protons from the Gustaf Werner Institute cyclotron. European Council for Nuclear Research, CERN/T/AET-5, 10 p. (1953).
NSA 9, 2460 (55)
- 406 Lee C. Teng
Continual injection into circular ion accelerators. Rev. Sci. Instr. 27, 106-7 (1956).
NSA 10, 4960 (56); CA 51, 7882b (57); and SA A59, 5944 (56)
- 407 Lee C. Teng
Linear theory of betatron oscillations in sectorial cyclotrons. Rev. Sci. Instr. 27, 1051-8 (1956).
NSA 11, 4140 (57) and SA A60, 4462 (57)

- 408 Thornton, Boyer, Peterson, Taylor, Stahl, Hernandez, and Putnam
Cyclotrons designed for precision fast-neutron cross-section measurements. Proc. Intern. Conf. Peaceful Uses Atomic Energy, Geneva, 1955, 4, 87-91 (1956).
CA 50, 12667e (56)
- 409 Yatendra Pal Varshni
A new particle accelerator. Nuclear Instr. 1, 280 (1957).
G. B.
- 410 R. K. Wakerling and A. Guthrie
Electrical circuits for calutrons. U. S. Atomic Energy Comm., TID-5216, 280 p. (1949).
CA 50, 1473e (56)
- 411 Walker, Fremlin, Link, and Stephens
The acceleration of heavy ions in a fixed-frequency cyclotron. Brit. J. Appl. Phys. 5, 157-64 (1954).
NSA 8, 4430 (54); CA 48, 10441i (54); and SA A57, 6669 (54)
- 412 W. Walkinshaw and N. M. King
Linear dynamics in spiral-ridge cyclotron design. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-2050, 44 p. (1956).
NSA 11, 5633 (57)
- 413 N. S. Wall and J. W. Irvine, Jr.
Preparation of unusual targets for cyclotron studies. Rev. Sci. Instr. 24, 1146-47 (1953).
CA 48, 5662b (54)
- 414 L. F. Wouters
Considerations on the effect of beam-dee coupling in a cyclotron rf system. California, Univ., Berkeley, Rad. Lab., UCRL-1865, 56 p. (1952).
NSA 10, 9639 (56)
- 415 H. P. Yockey
Cyclotron techniques in studies of radiation effects. North American Aviation, Inc., Los Angeles, Calif., NAA-SR-21, 18 p. (1948).
NSA 10, 5411 (56)
- 416 N. F. Ziegler
An rf system for a variable-energy cyclotron. Oak Ridge National Lab., Tenn., CF-54-2-92, 21 p. (1954).
NSA 10, 10978 (56)
- 417 N. F. Ziegler
Electrical measurements on a multiple-particle cyclotron model. Oak Ridge National Lab., Tenn., CF-55-8-73, 28 p. (1955).
NSA 10, 10979 (56)

- 418 N. F. Ziegler
An automatic cyclotron-tuning system. Oak Ridge National Lab.,
Tenn., CF-55-4-71, 10 p. (1955).
NSA 11, 2743 (57)

SYNCHROTRON

- 419 J. B. Adams
The alternating-gradient proton synchrotron. Nuovo cimento (10) 2,
Suppl. 1, 355-74 (1955).
NSA 10, 410 (56); SA A58, 9713 (55); and SA B59, 337 (56)
- 420 J. B. Adams
The design of the foundations for the magnet of the CERN alternating-
gradient proton synchrotron. European Council for Nuclear Research,
CERN-56-21, 62 p. (1956).
NSA 11, 1356 (57)
- 421 J. B. Adams
Acceleration of nuclear particles in curved paths. Cyclotron,
synchrocyclotron, and synchrotron (a review). Engineering 180,
530-5 (1955).
CA 50, 67h (56)
- 422 J. B. Adams and F. K. Goward
Lecture on orbits in the strong-focusing synchrotron (delivered at
Saclay, May 21, 1953). European Council for Nuclear Research,
CERN/PS/JBA-FKG-1, 26 p. (1953).
NSA 8, 5955.(54)
- 423 Yu M. Ado
A method of measuring the radial phase oscillations of electrons in a
synchrotron. Zhur. Eksper. Teor. Fiz. 31, 533-4 (1956) (In Russian).
SA A60, 4435 (57)
- 424 Yu M. Ado and P. A. Cherenkov
Distribution of energy in the spectrum of noncoherent radiation of
electrons moving in a synchrotron. Doklady Akad. Nauk S.S.S.R.
110, 35-7 (1956) (In Russian).
SA A60, 5399 (57)
- 425 Edward S. Akeley
The magnetic field and the equations of motion in spherical coordinates
for the Mark V FFAG accelerator. Purdue Univ. and Midwestern
Univ. Research Assn. MURA-ESA-4, 23 p. (1956).
NSA 10, 7014 (56)
- 426 G. G. Alway
The use of the Pilot Ace for testing a new design of proton synchrotron.
Proc. Inst. Elec. Engrs., Paper No. 2032M; publ. Mar. 1956, to be
republ. in Vol. 103B (1956).
SA B59, 1948 (56)

- 427 G. M. Anderson and D. J. Zaffarano
Determination of the angular spreads of the x-ray beam from the
I. S. C. 70-Mev synchrotron. Ames Lab., Ames, Iowa. ISC-588,
69 p. (1955).
NSA 10, 2180 (56)
- 428 Argonne National Laboratory
Particle Accelerator Division, summary report for April through
September 1956. Argonne National Lab., Lemont, Ill., ANL-5630,
47 p. (1956).
NSA 11, 1355 (57)
- 429 Australian National University
The Canberra air-cored proton synchrotron. Australian National
Univ., Research School of Physical Sciences, NP5240, 14 p. (1954).
NSA 8, 5375 (54)
- 430 C. J. Bakker
The proton synchrotron. Ned. Tijdschr. Natuurk. 21, 201-9 (1955)
(In Dutch).
NSA 10, 410 (56)
- 431 S. E. Barden
Space-charge forces in a strong-focusing synchrotron. Phys. Rev.
93, 1378-80 (1954).
CA 48, 6850a (54)
- 432 J. S. Bell
Stability of perturbed orbits in the synchrotron. Atomic Energy
Research Establishment, Harwell, England, AERE-T/R-1383, 18 p.
(1954).
NSA 8 4423 (54) and SA B57, 5202 (54)
- 433 M. Bell
Perturbation formulae for Hill's equation. Atomic Energy Research
Establishment, Harwell, Berkshire, England, AERE-T/M-139, 10 p.
(1956).
NSA 10, 10594 (56)
- 434 M. Bell
Nonlinear equations of motion in the synchrotron. Atomic Energy
Research Establishment, Harwell, England, AERE-T/M-125, 14 p.
(1955).
NSA 9, 7161 (55) and SA A58, 8810 (55)
- 435 J. W. Blamey
The orbital magnet and power supply of the 10 Gev proton synchrotron
at the Australian National University. Proc. CERN Symposium (1956),
Vol. 1, p. 354-358.
G. B.

- 436 Augustin Blaquiere
On the orbits in the strong-focusing cosmotron by a nonlinear approximation. *Compt. rend.* 239, 1285-7 (1954) (In French).
NSA 9, 1371 (55); SA A58, 1914 (55); and SA B58, 1229 (55)
- 437 John P. Blewett
The proton synchrotron. *Repts. Progr. Phys.* 19, 37-79 (1956).
NSA 11, 732 (57) and SA A59, 8831 (56)
- 438 John P. Blewett
Recent developments in proton synchrotrons. *Ann Rev. Nucl. Sci.* 4, 1-12 (1954).
NSA 9, 3991 (55) and CA 49, 2195h (55)
- 439 E. Bodenstedt
On the phase oscillations of a strong-focusing synchrotron (an investigation using a mechanical analogue machine). *Ann. Phys. (Leipzig)* 15, No. 1, 35-54 (1954) (In German).
SA A58, 992 (55)
- 440 N. E. Booth and G. W. Hutchinson
Fine time-structure of beams from the Birmingham proton synchrotron. *Nuclear Instr.* 1, 80-5 (1957).
NSA 11, 5637 (57)
- 441 W. M. Brobeck and W. C. Struven
Bevatron frequency measurement system. *Electronics* 29, No. 5, 182-7 (1956).
SA B59, 4563 (56)
- 442 F. G. Brockman and M. W. Louwerse
Ferrocube transformer core used in the Brookhaven cosmotron. *Phillips Tech. Rev.* 15, 73-83 (1953).
CA 48, 6271f (54)
- 443 Bronca, Bruck, Hamelin, Neyret, and Bolzinger
Le test des blocs de l'ectro aimant du synchrotron de Saclay. *Nuclear Instr.* 1, 123 (1957).
G. B.
- 444 H. Bruck and R. Levy-Mandel
The Saclay proton-synchrotron project. *Nuovo cimento* (10) 2, Suppl. 1, 423-41 (1955).
NSA 10, 415 (56); SA A59, 2187 (56); and SA B59, 1508 (56)
- 445 Bureau, Austerheim, and Zaffarano
An electron injector for a 70-Mev synchrotron. Ames Lab. ISC-490, 11 p. (1954).
NSA 8, 5373 (54)

- 446 Bureau, Austerheim, and Zaffarano
An electron injector for a 70 Mev synchrotron. *Rev. Sci. Instr.* 25,
1129-30 (1954).
SA A58, 4714 (55) and SA B58, 2885 (55)
- 447 E. L. Burshtein and L. S. Solov'ev
On the theory of alternating focusing. *Doklady Akad. Nauk S.S.S.R.*
109, 721-4 (1956) (In Russian).
SA A60, 1380 (57)
- 448 A. Citron and M. G. N. Hine
Experimental facilities of the CERN proton synchrotron. *Nuovo cimento*
(10) 2, Suppl. 1, 375-91 (1955).
NSA 10, 411 (56); SA A58, 9714 (55); and SA B59, 338 (56)
- 449 Citron, Gentner, and Sittkus
Considerations for a radiation shield for a 24-Bev proton synchrotron.
Strahlentherapie 94, 23-8 (1954) (In German).
NSA 8, 5376 (54) and CA 48, 11202h (54)
- 450 F. T. Cole
Mark V FFAG expanded equations of motion. *Midwestern Univ. Re-*
search Assn., Urbana, Ill., MURA-FTC-3, 42 p. (1956).
NSA 10, 5999 (56)
- 451 Bruce Cork
The Bevatron 9.9-Mev proton linear accelerator. *California, Univ.*,
Berkeley, Rad. Lab., UCRL-2385, 35 p. (54).
NSA 8, 6563 (54)
- 452 B. Cork
Proton linear-accelerator injector for the Bevatron. *Rev. Sci. Instr.*
26, 210-19 (1955).
SA A58, 4733 (55); SA B58, 2527 (55); and CA 49, 12143h (55)
- 453 Cork, Chupp, and Lofgren
Bevatron operation and development. Part IV. *California, Univ.*,
Berkeley, Rad. Lab., UCRL-2954, 15 p. (1955).
NSA 9, 5509 (55)
- 454 Cottingham, Plotkin, and Raka
Electronic equipment for an electron analogue accelerator. *I.R.E.*
Trans. Nuclear Sci. NS-1, 12-17 (1954).
NSA 10, 1592 (56)
- 455 E. D. Courant
Field inhomogeneities in alternating-gradient synchrotrons. *Phys.*
Rev. 91, 456 (1953).
CA 49, 10071h (55)

- 456 E. A. Crosbie and M. Hamermesh
Coupling of betatron and phase oscillations in a synchrotron. *Phys. Rev.* 98, 232 (1955).
CA 50, 10547i (56)
- 457 W. K. Dawson
Energy and distribution of photoprotons produced by 70 Mev x-rays.
Can. J. Phys. 34, 1480-96 (1956).
CA 51, 3315d (57)
- 458 J. de Boer
The 30-Bev proton synchrotron of the European Nuclear Physics Laboratory. *Ned. Tijdschr. Natuurk.* 20, 97 (1954) (In Dutch).
NSA 8, 4735 (54)
- 459 Denis, De Raad, Petrucci, Resegotti, and Sarazin
Mesures du champ et du gradient du champ dans une section droite du modele AC III B. (Measurements of the field and field gradient in a plane section of the model AC III B). European Council for Nuclear Research, CERN-PS/MM-5, 47 p. (1954).
NSA 9, 391 (55)
- 460 Denis, Germain, De Raad, Petrucci, Resegotti, Sarazin, Stroot, and Brianti
Mesures du champ sur la maquette AC III B. (Field measurements for model AC III B). European Council for Nuclear Research, CERN-PS/MM-6, 10 p. (1954).
NSA 9, 770 (54)
- 461 Harry Denman
Numerical techniques. *Midwestern Universities Research Assn.*, Urbana, Ill., MURA-201, 16 p. (1956).
NSA 11, 716 (57)
- 462 D. C. dePackh
Theory of the optically focused synchrotron. *Naval Research Lab.*, Washington, D. C., NRL-4608, 34 p. (1955).
NSA 10, 1081 (56)
- 463 Duke, Lack, March, Gibson, McKeague, Hughes, and Muirhead
Proton-proton elastic scattering at 950 Mev. *Phil. Mag.* 46, 877-83 (1955).
CA 51, 2414g (57)
- 464 European Council for Nuclear Research
Possible variations of the guiding field in a synchrotron due to the transients in the magnet circuit. European Council for Nuclear Research, CERN-PS/A, Sch.-1, 16 p. (1954).
NSA 8, 6314 (54)

- 465 European Council for Nuclear Research
On the validity of perturbation theory as a help for numerical integration of nonlinear equations of motion. European Council for Nuclear Research, CERN-PS/RH-2, 26 p. (1954).
NSA 8, 6562 (54)
- 466 European Council for Nuclear Research
Some remarks concerning basic definitions in orbit theory. European Council for Nuclear Research, CERN-PS/RH-3, 10 p. (1954).
NSA 8, 6841 (54)
- 467 European Council for Nuclear Research
Paper I. The alternating-gradient proton synchrotron. Paper II. Experimental facilities of the CERN proton synchrotron. European Council for Nuclear Research, CERN-PS/JBA-MGNH/23, 64 p. (1954).
NSA 9, 390 (55)
- 468 European Council for Nuclear Research
Mesures sur le modele AC III alimente en courant alternatif 50 Hz. European Council for Nuclear Research, CERN-PS/MM-7, 10 p. (1954).
NSA 9, 1367 (55)
- 469 European Council for Nuclear Research
Fonctionnement en impulsion de l'aimant modele AC III B. European Council for Nuclear Research, CERN-PS/MM-8, 24 p. (1954).
NSA 9, 1652 (55)
- 470 European Council for Nuclear Research
Mesures au moyen d'un integrateur du champ magnetique et de son gradient dans le modele AC III B, alimente en impulsion. European Council for Nuclear Research, CERN-PS/MM-9, 23 p. (1954).
NSA 9, 2923 (55)
- 471 European Council for Nuclear Research
Aimant AC III. European Council for Nuclear Research, CERN-PS/MM-10, 22 p. (1955).
NSA 9, 4296 (55)
- 472 European Council for Nuclear Research
Modele AC III. European Council for Nuclear Research, CERN-PS/MM-11, 39 p. (1955).
NSA 9 4297 (55)
- 473 European Council for Nuclear Research
Aimant DC IV Ière etude. European Council for Nuclear Research, CERN-PS/MM-12, 32 p. (1955).
NSA 9, 4580 (55)

- 474 European Council for Nuclear Research
Etude preliminaire du modele AC V avec alimentation continue.
European Council for Nuclear Research, CERN-PS/MM-13, 26 p.
(1955).
NSA 9, 4581 (55)
- 475 European Council for Nuclear Research
Etude de dispositifs pour l'alimentation en impulsion des maquettes
V et suivantes. European Council for Nuclear Research, CERN-PS/
MM-14, 22 p. (1955).
NSA 9, 5162 (55)
- 476 European Council for Nuclear Research
Mesures dynamiques sur le modele AC V. European Council for
Nuclear Research, CERN-PS/MM-15, 33 p. (1955).
NSA 9, 5163 (55)
- 477 European Council for Nuclear Research
Mesures dynamiques preliminaires sur les modeles AC VI et AC VII.
European Council for Nuclear Research, CERN-PS/MM-16, 14 p.
(1955).
NSA 9, 6084 (55)
- 478 European Council for Nuclear Research
Mesures statiques du champ magnetique et de son gradient sur les
maquettes VI et VII. European Council for Nuclear Research, CERN-
PS/MM-17, 21 p. (1955).
NSA 9, 6085 (55)
- 479 European Council for Nuclear Research
Etudes des proprietes magnetiques des toles des aimants du synchro-
tron a proton. European Council for Nuclear Research, CERN-PS/
MM-18, 40 p. (1955).
NSA 9, 6494 (55)
- 480 European Council for Nuclear Research
Enroulements polaires de compensation etudes preliminaires. Euro-
pean Council for Nuclear Research, CERN-PS/MM-19, 14 p. (1955).
NSA 9, 7557 (55)
- 481 European Council for Nuclear Research
Influence de la forme des cycles d'impulsions sur le champ remanent.
Maquettes V-VI-VII. European Council for Nuclear Research, CERN-
PS/MM-20, 16 p. (1955).
NSA 10, 409 (56)
- 482 European Council for Nuclear Research
Mesures dynamiques sur les modeles AC V et AC VI. European
Council for Nuclear Research, CERN-PS/MM-21, 29 p. (1955).
NSA 10, 1076 (56)

- 483 European Council for Nuclear Research, Proton Synchrotron Group
 Etude des tensions d'alimentation de l'aimant du synchrotron a
 protons. European Council for Nuclear Research, Proton Synchrotron
 Group, CERN-PS/MM-22, 12 p. (1955).
 NSA 10, 1077 (56)
- 484 European Council for Nuclear Research, Proton Synchrotron Group
 Integrateur electronique pour les mesures dynamiques du champ
 magnetique et de son gradient. European Council for Nuclear Research,
 Proton Synchrotron Group, CERN-PS/MM-23, 21 p. (1956).
 NSA 10, 8012 (56)
- 485 European Council for Nuclear Research
 Injection dans le synchrotron--recherche d'un dispositif de deflection.
 European Council for Nuclear Research, CERN-PS/PL-1, 27 p. (1954).
 NSA 9, 771 (55)
- 486 European Council for Nuclear Research
 Injection dans le synchrotron. Reglage de l'acceptance du synchrotron.
 European Council for Nuclear Research, CERN-PS/PL-3, 35 p. (1955).
 NSA 9, 4582 (55)
- 487 European Council for Nuclear Research
 Injection dans le synchrotron. Aberrations. European Council for
 Nuclear Research, CERN-PS/PL-4, 28 p. (1955).
 NSA 9, 5164 (55)
- 488 Fowler, Shutt, Thorndike, and Whittemore
 Pions and protons from a target bombarded by 2.3-Bev protons in the
 cosmotron. Phys. Rev. 91, 479 (1953).
 CA 49, 10072f (55)
- 489 Christian Fronsdal
 On the equations of motion of particles moving in the alternating-
 gradient proton accelerator. European Council for Nuclear Research,
 CERN/T/CF-1, 10 p. (1952).
 NSA 9, 2461 (55).
- 490 R. Gabillard
 Use of the Hall effect for the production of frequencies associated with
 the value of a magnetic field by the functions
- $$f = kB, f = \frac{k}{B}, f = k \sqrt{\frac{B}{B^2 + B_0^2}}$$
- European Council for Nuclear Research, CERN-PS/R/Gb-6, 11 p.
 (1954)
 NSA 9, 392 (55)
- 491 L. L. Goldin and D. G. Koskarev
 Synchrotron oscillations in strong-focusing accelerators (linear
 theory). Nuovo cimento (10) 2, 1251-68 (1955).
 SA A59, 2919 (56)

- 492 G. Ghigo and I. F. Quercia
Field stabilization in a dc-ac excited magnet of a synchrotron. *Nuclear Instr.* 1, 57-61 (1957).
NSA 11, 5636 (57)
- 493 L. L. Goldin and D. G. Koskarev
Synchrotron oscillations in strong-focusing accelerators. *Nuovo cimento* (10) 2, 1251-68 (1955) (In English).
NSA 10, 4963 (56)
- 494 S. J. Goldsack
Two-target operation of a proton synchrotron. *Nucl. Instr.* 1, 90-1 (1957).
NSA 11, 5639 (57)
- 495 P. Grivet
The giant synchrotrons or cosmotrons. *Rev. gén. elec.* 64, 239-62 (1955) (In French).
CA 49, 11429d (55) and SA B58, 3813 (55)
- 496 F. Grütter
General considerations on the power supply for the magnets of high-energy proton synchrotrons. *European Council for Nuclear Research, CERN-PS/FG-1*, 16 p. (1954).
NSA 9, 1098 (55)
- 497 F. Grütter
Magnetic power supply. Pool-cathode mercury-arc converters for high-energy proton-synchrotron magnet power supplies. *European Council for Nuclear Research, CERN-PS/FG-2*, 52 p. (1955).
NSA 10, 408 (56)
- 498 R. Hagedorn
Relations between survey and stacking of magnets and statistical distribution of F-type perturbations. *European Council for Nuclear Research, Proton Synchrotron Group, CERN-PS/RH-8*, 50 p. (1955).
NSA 9, 7165 (55)
- 499 Peter Hall and S. Legvold
Remanent magnetism in toroids. *Ames Lab., Ames, Iowa, ISC-630*, 21 p. (1955).
NSA 9, 7166 (55)
- 500 Hammer, Pidd, and Terwilliger
Betatron oscillations in the synchrotron. *Rev. Sci. Instr.* 26, 555-6 (1955).
NSA 9, 5787 (55); SA A58, 8000 (55); and SA B58, 3818 (55)

- 501 C. L. Hammer and A. J. Bureau
A method for the prompt destruction of the electron beam in a conventional synchrotron. Part 1. Iowa State College, Ames Lab., ISC-558, 17 p. (1954).
NSA 9, 2022 (55)
- 502 C. L. Hammer and A. J. Bureau
A method for the prompt destruction of the electron beam in a conventional synchrotron. Part 2. Iowa State College, Ames Lab., ISC-561, 9 p. (1955).
NSA 9, 2023 (55)
- 503 C. L. Hammer and A. J. Bureau
Method for the prompt destruction of the electron beam in a synchrotron. I. Rev. Sci. Instr. 26, 594-8 (1955).
SA A58, 8004 (55) and SA B58, 3816 (55)
- 504 C. L. Hammer and A. J. Bureau
Method for the prompt destruction of the electron beam in a synchrotron. II. Rev. Sci. Instr. 26, 598-600 (1955).
SA A58, 8005 (55) and SA B58, 3817 (55)
- 505 Walter Hartsough
Bevatron operation and development. VII. California, Univ., Berkeley, Rad. Lab., UCRL-3236, 26 p. (1955).
NSA 10, 3239 (56)
- 506 Walter Hartsough
Bevatron operation and development. VIII. California, Univ., Berkeley, Rad. Lab., UCRL-3332, 31 p. (1956).
NSA 10, 8018 (56)
- 507 Walter Hartsough
Bevatron operation and development. IX. California, Univ., Berkeley, Rad. Lab., UCRL-3444, 26 p. (1956).
NSA 11, 1357 (57)
- 508 Walter Hartsough
Bevatron operation and development. XI. California, Univ., Berkeley, Rad. Lab., UCRL-3614, 20 p. (1956).
NSA 11, 4724 (57)
- 509 Harry G. Heard
A new method for controlling the magnetic field in the aperture of synchrotrons. California, Univ., Berkeley, Rad. Lab., UCRL-3427, 12 p. (1956).
NSA 10, 10598 (56) and CA 51, 877f (57)

- 510 Harry G. Heard
Slow and fast structure of secondary-particle beams of the Bevatron.
California, Univ., Berkeley, Rad. Lab., UCRL-3428, 18 p. (1956).
NSA 11, 718 (57) and CA 51, 2411c (57)
- 511 Harry G. Heard
Bevatron operation and development. VI. California, Univ., Berkeley,
Rad. Lab., UCRL-3212, 28 p. (1955).
NSA 10, 2181 (56)
- 512 Harry G. Heard and Edward J. Lofgren
Bevatron operation and development. V. California, Univ., Berkeley,
Rad. Lab., UCRL-3033, 22 p. (1955).
NSA 10, 1081 (56)
- 513 Harry G. Heard
Production of prolonged secondary particle beams in the Bevatron with
thin foils. California, Univ., Berkeley, Rad. Lab., UCRL-3608, 6 p.
(1956).
NSA 11, 4723 (57) and CA 51, 8542a (57)
- 514 L. U. Hibbard
The radiofrequency system of the Birmingham proton synchrotron.
J. Sci. Instr. 31, 363-71 (1954).
SA A57, 11127 (54) and SA B58, 355 (55)
- 515 K. Huke and G. Iwata
The effect of field bump in a strong-focusing synchrotron. J. Phys.
Soc. Japan 9, 297-8 (1954).
NSA 8, 4151 (54) and SA A57, 11126 (54)
- 516 H. Humbach
Permissible adjustment tolerances for a strong-focusing synchrotron.
Z. Angew. Phys. 7, 423-7 (1955) (In German).
NSA 10, 6002 (56); SA A58, 9707; and CA 50, 5415g (56)
- 517 H. Humbach
Radiation damping in a particle accelerator with a circular magnetic
focusing field. Z. Naturforsch. 10a, 347-8 (1955) (In German).
SA A58, 7130 (55)
- 518 J. V. Jelley
Design of a Cherenkov counter for the proton synchrotron at Birming-
ham. Atomic Energy Research Establishment, Harwell, England,
AERE-NP/R-1770, 15 p. (1955).
CA 50, 9165b (56)
- 519 Kjell Johnsen
Momentum-compaction relationship in the new-type synchrotron with
straight sections. European Council for Nuclear Research, CERN-
PS/KJ-10, 8 p. (1952).
NSA 8, 5956 (54)

- 520 Kjell Johnsen
Phase oscillations. European Council for Nuclear Research, CERN-PS/KJ-11, 8 p. (1952).
NSA 8, 5957 (54)
- 521 Kjell Johnsen
The effect of straight sections of different lengths in a S. F. S. European Council for Nuclear Research, CERN-PS/KJ-14, 3 p. (1953).
NSA 9, 1099 (55)
- 522 Kjell Johnsen
S. F. S. with compensating sections to make up for changes in the field index. European Council for Nuclear Research, CERN-PS/KJ-15, 7 p. (1953).
NSA 8, 5958 (54)
- 523 Kjell Johnsen
Some thoughts about possible methods to compensate for perturbations on the free oscillations caused by unavoidable inhomogeneities. European Council for Nuclear Research, CERN-PS/KJ-16, 3 p. (1954).
NSA 9, 1100 (55)
- 524 Kjell Johnsen
Some numerical data for eight different alternatives of a strong-focusing synchrotron having an average radius of 150 m and giving 30 Gev protons. European Council for Nuclear Research, CERN-PS/KJ-17, 4 p. (1953).
NSA 9, 1101 (55)
- 525 Kjell Johnsen
Frequency and momentum tolerances at injection and supplement to CERN-PS/KJ-18. European Council for Nuclear Research, CERN-PS/KJ-18, 4 p. (1953).
NSA 8, 5959 (54)
- 526 Kjell Johnsen
A discussion of the phase equation in the neighborhood of the transition energy. European Council for Nuclear Research, CERN-PS/KJ-21, 6 p. (1953).
NSA 8, 5960 (54)
- 527 Lawrence W. Jones
Concentric and eccentric colliding-beams geometries. Michigan, Univ., Ann Arbor, and Midwestern Univ. Research Assn., MURA-LWJ-11, 7 p. (1956).
NSA 10, 7017 (56)
- 528 Jones, Kratz, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies
A 300-Mev nonferromagnetic electron synchrotron. General Electric Research Lab., Schenectady, N. Y., 55-RL-1314, 51 p. (1955).
NSA 9, 7558 (55)

- 529 Jones, Kratz, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies
Vacuum system for 300-Mev nonferromagnetic synchrotron. General
Electric Research Lab., Schenectady, N. Y., 55-RL-1315, 11 p.
(1955).
NSA 9 6086 (55)
- 530 Jones, Kratz, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies
300-Mev nonferromagnetic electron synchrotron. Rev. Sci. Instr.
26, 809-26 (1955).
SA A58, 9692 (55); SA B59, 336 (56); and CA 51, 877f (57)
- 531 Kerst, Cole, Crane, Jones, Laslett, Ohkawa, Sessler, Symon, Terwilliger,
and Vogt-Nilsen
Attainment of very high energy by means of intersecting beams of
particles. Phys. Rev. 102, 590-1 (1956).
NSA 10, 8696 (56) and SA A59, 5157 (56)
- 532 A. A. Kolomenskii
Excitation of synchrotron oscillation due to electron radiation fluctua-
tion in strong-focusing accelerators. Soviet Phys. JETP 3, 132-3
(1956) (In English) and Zhur. Eksper. i Teoret. Fiz. 30, 207-9 (1956)
(In Russian).
NSA 10, 11545 (56) and SA A59, 6689 (56)
- 533 A. A. Kolomenskii
On the influence of radiative quantum fluctuations on the motion of
electrons in periodic magnetic systems. Doklady Akad. Nauk S.S.S.R.
107, 398-401 (1956) (In Russian).
SA A59, 7456 (56)
- 534 A. A. Kolomenskii and A. N. Lebedev
The role of radiational losses in cyclic accelerators. Soviet Phys.
JETP 3, 946-7 (1957).
NSA 11, 4141 (57)
- 535 A. A. Kolomenskii and L. L. Sabsovich
On passage through the critical energy in a strong-focusing accelerator.
Zhur. Tekh. Fiz. 26, 576-84 (1956) (In Russian).
SA A60, 465 (57)
- 536 Korolev, Markov, Akimov, and Kulikov
Experimental investigation of angular distribution and polarization of
optical radiation of electrons in a synchrotron. Doklady Akad. Nauk
S.S.S.R. 110, 542-4 (1956) (In Russian).
SA A60, 5400 (57)
- 537 Von p. Kunze
Circular accelerators. Naturwissenschaften 43, 457-65 (1956).
NSA 11, 2157 (57)

- 538 Glen R. Lambertson
Testing the magnetic field of the Bevatron. California, Univ., Berkeley,
Rad. Lab., UCRL-2818, 29 p. (1954).
NSA 9, 2663 (55)
- 539 P. Lapostolle
Injection in the synchrotron. New deflection scheme. European
Council for Nuclear Research, Proton Synchrotron Group, CERN-PS/
PL-5, 10 p. (1955).
NSA 10, 1078 (56)
- 540 L. Jackson Laslett
Analysis and computations of magnetic fields arising from two-dimen-
sional pole configurations of interest in spiral-sector accelerators.
Midwestern Univs. Research Assn., MURA-LJL-9, 47 p. (1956).
NSA 10, 7016 (56)
- 541 L. Jackson Laslett
Fixed-field alternating-gradient accelerators. Science 124, 781-7
(1956).
NSA 11, 1362 (57) and CA 51, 4827g (57)
- 542 L. Jackson Laslett
Proposed method for determining Mark V trajectories by aid of grid
storage. Midwestern Univs. Research Assn., Urbana, Ill., MURA-
LJL-8 (Rev.), 14 p. (1956).
NSA 10, 8017 (56)
- 543 B. Ledley and L. Riddiford
Determination of a proton synchrotron beam size with a crystal
scintillator. Proc. Phys. Soc. A68, pt. 9, 836-9 (1955).
SA A58, 9709 (55) and CA 50, 686h (56)
- 544 E. J. Lofgren and H. G. Heard
Bevatron operation and development III. (August to October, 1954).
California, Univ., Berkeley, Rad. Lab., UCRL-2822, 28 p. (1955).
NSA 9, 3664 (55)
- 545 Gerhart Lüders
Remarks on a manuscript by J. D. Lawson. European Council for
Nuclear Research, CERN/T/GL-3, 9 p. (1952).
NSA 9, 2462 (55)
- 546 Gerhart Luders
Orbit instabilities in the new-type synchrotron (linear approximation).
European Council for Nuclear Research, CERN/T/GL-4, 21 p. (1953).
NSA 8, 5962 (54)

- 547 Gerhart Lüders
Further contributions to the theory of linear disturbances of the betatron oscillations in an a.-g. synchrotron. European Council for Nuclear Research, CERN-PS/GL-6, 18 p. (1953).
NSA 8, 5053 (54)
- 548 Gerhart Lüders
Statistical analysis of closed orbit and stop bands. European Council for Nuclear Research, CERN-PS/GL-8, 23 p. (1953).
NSA 8, 5954 (54)
- 549 Gerhart Lüders
Theory of particle orbits in the alternating-gradient synchrotron. Nuovo cimento (10) 2, Suppl. 1, 392-402 (1955).
NSA 10, 412 (56); SA A58, 9693 (55); and SA B59, 333 (56)
- 550 Gerhart Lüders
On the effect of magnetic field errors on the betatron oscillations in the strong-focusing synchrotron. Nuovo cimento (10) 2, Suppl. 4, 1075-1146 (1955) (In German).
NSA 10, 4964 (56); SA A59, 4435 (56); and SA B59, 2349 (56)
- 551 Gerhart Lüders
On the influence of irregularities of magnetic field on betatron oscillations in an alternating-gradient synchrotron. European Council for Nuclear Research, CERN-56-8, 23 p. (1956). Trans. from Nuovo cimento (10) 2, Suppl. 4, 1075-1146, 81 p. (1955) (In German).
NSA 10, 7013 (56)
- 552 Dick A. Mack
Bevatron operation. IRE Convention Record 3, Part 10, 199-203 (1955).
NSA 9, 7946 (55)
- 553 Madey, Bandtel, and Frank
The radiofrequency fine structure of the photon beam from the Berkeley synchrotron. Rev. Sci. Instr. 25, 537-40 (1954).
SA A57, 10253 (54)
- 554 Madey, Bandtel, and Frank
The radiofrequency fine structure of the photon beam from the Berkeley synchrotron. Phys. Rev. 92, 537 (1953).
CA 49, 10073f (55)
- 555 John Marshall
The Soviet 10-Bev proton synchrotron. Argonne National Lab., Lemont, Ill., ANL-5615, 21 p. (1956).
NSA 10, 12060 (56)

- 556 A. N. Matveev
On the influence of radiation on betatron oscillations of electrons in strong-focusing synchrotrons. Doklady Akad. Nauk S.S.S.R. 107, 677-4 (1956) (In Russian).
NSA 10, 7020 (56) and SA A59, 7457 (56)
- 557 A. N. Matveev
Radiation resonance in synchrotrons. Zhur. Eksper. Teor. Fiz. 30, 804 (1956) (In Russian).
SA A60, 464 (57)
- 558 A. N. Matveev
Radiation resonance in synchrotrons. Soviet Phys. JETP 3, 959-60 (1957).
NSA 11, 4143 (57)
- 559 A. N. Matveev
The motion of electrons in cyclic accelerators as a stochastic process. Doklady Akad. Nauk S.S.S.R. 109, 495-8 (1956) (In Russian).
SA A60, 1356 (57)
- 560 McFarlane, Barden, and Oldroyd
The Glasgow 340-Mev synchrotron. Nature 176, 666-9 (1955).
NSA 10, 421 (56); SA A59, 4434 (56); and SA B59, 2348 (56)
- 561 L. R. McMurray and D. J. Zaffarano
A possible method for beam extraction from an alternating-gradient synchrotron. Ames Lab., Ames, Iowa, ISC-647, 31 p. (1955).
NSA 10, 8013 (56)
- 562 Midwestern Universities Research Assn.
Bucket area parameters. Midwestern Univ. Research Assn., Urbana, Ill., MURA-106 (Suppl. 1), 4 p. (1956).
NSA 11, 4722 (57)
- 563 P. B. Moon
Space charge and ionization phenomena in constant-gradient proton synchrotrons. Proc. Phys. Soc. (London) A69, 153-6 (1956).
NSA 10, 8021 (56); SA A59, 3784 (56); and CA 50, 16423e (56)
- 564 Moon, Riddiford, and Symonds
Experimental characteristics of the proton synchrotron. Proc. Roy. Soc. A, 230, 204-15 (1955).
SA A58, 6226 (55) and CA 49, 14495i (55)
- 565 M. J. Moravcsik and J. M. Sellen, Jr.
Gas scattering in a strong-focusing electron synchrotron. Rev. Sci. Instr. 26, 1158-64 (1955).
NSA 10, 2184 (56); CA 51, 6368d (57); and SA A59, 2918 (56)

- 566 L. B. Mullett
Gas scattering in proton synchrotrons. Atomic Energy Research
Establishment, Harwell, England, GP/R 2072, 20 p. (1956).
CA 51, 5579c (57)
- 567 National Bureau of Standards
Protection against betatron-synchrotron radiations up to 100 million
electron volts. U. S. Dept. Commerce, Washington, D. C., National
Bureau of Standards Handbook No. 55, 52 p. (1955).
CA 50, 3118c (56)
- 568 J. S. Nodvick and D. S. Saxon
On the suppression of coherent radiation by electrons in a synchrotron.
California, Univ., Los Angeles, NP-5197, 18 p. (1954).
NSA 8, 4426 (54)
- 569 J. S. Nodvick and D. S. Saxon
Suppression of coherent radiation by electrons in a synchrotron. Phys.
Rev. 96, 180-4 (1954).
SA A57, 11125 (54)
- 570 Tihiro Ohkawa
Mark V with scalloped motion in the axial direction. Midwestern
Univs. Research Assn. and Illinois, Univ., Urbana, MURA-TO-5,
7 p. (nd).
NSA 10, 6001 (56)
- 571 Tihiro Ohkawa
A scaled radial sector FFAG for intersecting beams. Illinois, Univ.,
Urbana, and Midwestern Univs. Research Assn., Urbana, MURA-TO-
6, 4 p. (1956).
NSA 10, 8694 (56)
- 572 M. L. Oliphant
The acceleration of protons to energies above 10 Bev. Proc. Roy.
Soc. (London) A234, 441-56 (1956).
NSA 10, 8022 (56); SA A59, 5943 (56); and CA 50, 9891a (56)
- 573 Gerard K. O'Neill
Storage-ring synchrotron: Device for high-energy physics research.
Phys. Rev. 102, 1418-19 (1956).
NSA 10, 9646 (56); CA 50, 14382d (56); and SA A59, 6718 (56) SAA59,
- 574 Iu F. Orlov
The nonlinear theory of betatron oscillations in the strong-focusing
synchrotrons. Nuovo cimento (10) 3, 252-9 (1956) (In English).
NSA 10, 7024 (56) and SA A59, 4433 (56)

- 575 Iu F. Orlov
Excitation of betatron oscillations by synchrotron momentum oscillations in a strong-focusing accelerator. Zhur. Eksper. Teor. Fiz. 32, 130-4 (1957) (In Russian).
SA A60, 5403 (57)
- 576 Iu F. Orlov
Influence of the nearness to external resonance on the magnitude of the critical energy in an accelerator with strong focusing. Zhur. Eksper. Teor. Fiz. 30, 953-5 (1956) (In Russian).
SA A59, 8819 (56)
- 577 Iu F. Orlov
The influence of the proximity of an external resonance on the magnitude of the transition energy in a strong-focusing accelerator. Soviet Phys. JETP 3, 950-2 (1957).
NSA 11, 4142 (57)
- 578 G. D. Palazzi
A magnetic differential probe: its employment for the determination of the static median magnetic surface in the gap of a synchrotron. Nuovo cimento (10) 3, 336-49 (1956).
SA A59, 4483 (56)
- 579 D. Park
Asymptotic properties of Bessel functions and the radiation from a synchrotron. J. Math. Phys. 33, 179-84 (1954).
SA A58, 2796 (55)
- 580 E. Persico
A theory of the capture in a high-energy injected synchrotron. Nuovo cimento (10) 2, 459-69 (1955).
NSA 10, 417 (56); SA A58, 9695 (55); and SA B59, 335 (56)
- 581 E. Persico
The synchrotron and its problems. J. phys. radium 16, 360-5 (1955) (In French).
NSA 9, 6089 (55) and SA A58, 8024 (55)
- 582 Piccioni, Clark, Cool, Friedlander, and Kassner
External proton beam of the cosmotron. Brookhaven National Lab., BNL-2075, 8 p. (1954).
NSA 9, 1366 (55)
- 583 Piccioni, Clark, Cool, Friedlander, and Kassner
External proton beam of the cosmotron. Rev. Sci. Instr. 26, 232-3 (1955).
SA A58, 5452 (55)

- 584 Piccioni, Clark, Cool, Friedlander, and Kassner
External proton beam of the cosmotron. Phys. Rev. 98, 275 (1955).
CA 50, 10549d (57)
- 585 Purdue Research Foundation
Basic research with high-energy electrons and x-rays produced by a
300-Mev synchrotron. Progress report. Purdue Research Foundation,
Lafayette, Ind., COO-176, 46 p. (1954).
NSA 8, 7152 (54)
- 586 Purdue Research Foundation
Basic research with high-energy electrons and x-rays produced by a
300-Mev synchrotron. Progress report. Purdue Research Foundation,
Lafayette, Ind., COO-177, 40 p. (1955).
NSA 9, 7944 (55)
- 587 C. M. Ramm
The principles and apparatus of the injection system of the Birmingham
proton synchrotron. J. Sci. Instr. 33, 52-8 (1956).
NSA 10, 7022 (56); CA 50, 7607c (56); SA A59, 2937 (56); and SA B59,
3125 (56)
- 588 Ramm, Coe, and Vaughan
An analysis of injection phenomena in the Birmingham proton synchro-
tron. J. Sci. Instr. 33, 102-6 (1956).
NSA 10, 8020 (56); SA A59, 2936 (56); and CA 50, 9166c (57)
- 589 E. Regenstreif
On pole profiles yielding linear fields. European Council for Nuclear
Research, CERN-PS/er-40, 16 p. (1955).
NSA 9, 2661 (55)
- 590 E. Regenstreif
Minutes of CERN-PS staff meeting, September 29, 1954. European
Council for Nuclear Research, NP-5406, 6 p. (1954).
NSA 9, 393 (55)
- 591 E. Regenstreif
On the analytical determination of the field distribution in the rectangu-
lar version of Model 4. European Council for Nuclear Research, CERN-
PS/ER-39, 13 p. (1954).
NSA 9, 388 (55)
- 592 E. Regenstreif
On the design of pole-face windings. European Council for Nuclear
Research, CERN-PS/ER-41, 9 p. (1955).
NSA 9, 4295 (55)

- 593 E. Regenstreif
On the influence of magnetic end effects on the orbits. European Council for Nuclear Research, Proton Synchrotron Group, CERN-PS/ER-43, 13 p. (1955).
NSA 10, 1935 (56)
- 594 E. Regenstreif
On the influence of eddy currents in the vacuum chamber. European Council for Nuclear Research, CERN-PS/ER-42, 21 p. (1955).
NSA 10, 407 (56)
- 595 Riddiford, van de Raay, and Coe
Some proton-synchrotron beam studies with the induction electrode. Proc. Phys. Soc. (London) A68, 489-502 (1955).
NSA 9, 5785 (55); CA 49, 13800e (55); and SA A58, 6225 (55)
- 596 G. Salvini
Proposal of synchrotron with a double vacuum chamber. Nuovo cimento (9) 11, 555-8 (1954).
NSA 8, 4731 (54) and SA A57, 6656 (54)
- 597 G. Salvini
The Italian project for an electron synchrotron. Nuovo cimento (9) 12, Suppl. 1, 77-100 (1954) (In Italian).
SA A58, 319 (55) and SA B58, 354 (55)
- 598 G. Salvini
The 1000-Mev electron synchrotron of Frascati and possible research with it. Energia nucleare (Milan) 3, 435-49 (1956) (In Italian).
NSA 11, 4725 (57); SA A60, 5372 (57); and SA B60, 3677 (57)
- 599 G. Salvini
The Italian design of a 1000-Mev electron synchrotron: a comparison between the strong- and the weak-focusing. Nuovo cimento (10) 2, Suppl. 1, 442-58 (1955).
NSA 10, 416 (56); SA A58, 9694 (55); and SA B59, 334 (56)
- 600 Matthew Sands
Synchrotron oscillations induced by radiation fluctuations. Phys. Rev. 97, 47 (1955).
NSA 9, 2466 (55) and SA A58, 2784 (55)
- 601 G. Sasson
The sector profiles of the strong-focusing cosmotron in the case of small-diameter machines. Compt. rend. 238, 885-8 (1954) (In French).
SA A57, 8354 (54)
- 602 A. Schoch
Orbit stability in a synchrotron with nonlinear restoring forces. European Council for Nuclear Research, CERN-PS/A-SCH. 2, 25 p. (1955).
NSA 10, 2179 (56)

- 603 Joseph Seiden
Large-angle elastic scattering of protons in a synchrotron. *Compt. rend.* 240, 2519-20 (1955) (In French).
CA 50, 5415h (56) and SA A58, 8835 (55)
- 604 Joseph Seiden
Amplitudes of oscillations in the strong-focusing synchrotron. *Compt. rend.* 239, 798-800 (1954) (In French).
NSA 9, 398 (54) and SA A58, 993 (55)
- 605 Joseph Seiden
Orbital effects of the correlation between lens-alignment errors in the synchrotron. *Compt. rend.* 239, 966-8 (1954) (In French).
NSA 9, 399 (54); SA A58, 1913 (55); and SA B58, 1228 (55)
- 605 Joseph Seiden
The stability of orbits in the strong-focusing synchrotron. *Ann. phys.* 10, 259-304 (1955) (In French).
NSA 9, 4584 (55) and SA A59, 7131 (55)
- 607 Joseph Seiden
Diffusion of protons through the residual gas in a synchrotron. I. Elastic scattering. *J. phys. radium* 16, 917-25 (1955).
CA 69, 42c (56) and SA A59, 5155 (56)
- 608 Joseph Seiden
Diffusion of protons through the residual gas in a convergent cosmotron. *Compt. rend.* 237, 1075-7 (1953).
CA 48, 4322i (54)
- 609 Joseph Seiden
The orbit instabilities due to coupling between the radial and vertical oscillations in the cosmotron. *Compt. rend.* 238, 1010-12 (1954) (In French).
SA A57, 8355 (54) and SA B57, 3792 (54)
- 610 J. Seiden and F. Lurcat
The inelastic scattering of particles accelerated in a synchrotron. *Compt. rend.* 240, 2067-9 (1955) (In French).
NSA 9, 6091 (55) and SA A58, 8025 (55)
- 611 M. Seidl
Orbital accelerators of electrons. *Slaboproudý obzor* 17, 698-702 (1956) (In Czech).
SA B60, 2985 (57)
- 612 Thorbjorn Sigurgeirsson
Betatron oscillations in the strong-focusing synchrotron. *European Council for Nuclear Research, CERN/T/TS-2*, 17 p. (1952).
NSA 9, 2463 (55)

- 613 Thorbjorn Sigurgeirsson
Focusing in a synchrotron with periodic field-perturbation treatment.
European Council for Nuclear Research, CERN/T/TS-3, 13 p. (1953).
NSA 9, 2464 (55)
- 614 E. Smars and O. Wernholm
Design study of a strong-focusing electron synchrotron. Arkiv Fysik
7, 463-72 (1954).
NSA 8, 3872 (54); CA 48, 6843g (54); SA A57, 7479 (54); and SA B57,
3355 (54)
- 615 Lloyd Smith
Influence of imperfections in the rf system on phase oscillations in the
Bevatron. California, Univ., Berkeley, Rad. Lab., UCRL-3045,
16 p. (1955).
NSA 9, 7167 (55)
- 616 Sokolov, Ternov, and Strakhovskii
Investigation of stability of electron motion in cyclic accelerators
when quantum effects are included. Soviet Phys. JETP 4, 251-8
(1957).
NSA 11, 5646 (57)
- 617 H. Steinwedel
Particle orbits in circular accelerators. European Council for Nuclear
Research, CERN-56-20, 50 p. (1956).
NSA 10, 10595 (56)
- 618 Warren C. Struven
Bevatron magnet pulse-timing system. Electronics 24, No. 6, 160-3
(1956).
SA B60, 886 (57)
- 619 Warren F. Stubbins
Placement of the synchrotron beam on an internal target. Part I.
California, Univ., Berkeley, Rad. Lab., UCRL-2543, 13 p. (1954).
NSA 8, 6564 (54)
- 620 Warren F. Stubbins
Placement of the synchrotron beam on an internal target. Part II.
California, Univ., Berkeley, Rad. Lab., UCRL-2600, 7 p. (1954).
NSA 8, 6565 (54)
- 621 Warren F. Stubbins
Rapid placement of a synchrotron beam on an internal target. IRE
Trans. on Nuclear Sci. NS-2, 3-8 (1955).
SA B60, 3678 (57)

- 622 Symon, Kerst, Jones, Laslett, and Terwilliger
Fixed-field alternating-gradient particle accelerators. *Phys. Rev.*
103, 1837-59 (1956).
NSA 11, 731 (57); CA 50, 16423f (56); and SA A60, 1382 (57)
- 623 K. R. Symon and A. M. Sessler
Methods of radiofrequency acceleration in fixed-field accelerators
with applications to high-current and intersecting-beam accelerators.
Wisconsin, Univ., Madison; Ohio State Univ., Columbus; and Mid-
western Universities Research Assn., Urbana, Ill., MURA-KRS/AMS-1,
55 p. (1956).
NSA 10, 7015 (56)
- 624 Taieb, Guillon, Gabet, and Mey
Apparatus for measuring a variable magnetic field. *L'Onde Electrique*
35, 1076-83 (1955) (In French).
SA B59, 2205 (56)
- 625 Lee C. Teng
Continual injection into circular ion accelerators. *Rev. Sci. Instr.*
27, 106-7 (1956).
NSA 10, 4960 (56); CA 51, 7882b (57); and SA A59, 5944 (56)
- 626 Thibaud, Verzaux, and Salin
First results obtained with the 1-Mev particle accelerator installed
at Lyon. *Compt. rend.* *239*, 1483-5 (1954) (In French).
NSA 9, 1374 (55); CA 49, 4415i (55); and SA A58, 1911 (55)
- 627 D. H. Tombouliau and P. L. Hartman
Spectral distribution curves of the far-ultraviolet radiation from the
Cornell synchrotron. *Phys. Rev.* *95*, 600 (1954).
CA 50, 10543i (56)
- 628 D. H. Tombouliau and P. L. Hartman
Spectral and angular distribution of ultraviolet radiation from the 300-
Mev Cornell synchrotron. *Phys. Rev.* *102*, 1432-7 (1956).
SA A59, 5939 (56)
- 629 L. E. H. Trainor and S. B. Brown
A note on the x-ray spectrum of a 70-Mev synchrotron. *Can J. Phys.*
33, 110-12 (1955).
NSA 9, 2468 (55); CA 49, 4415i (55); and SA A58, 3812 (55)
- 630 Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits,
Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyazhsky,
Petukhov, Rabinovich, Rubchinsky, Sinelnikov, and Stolov
The 10-Bev proton synchrotron of the Academy of Sciences, U.S.S.R.
Soviet J. Atomic Energy *4*, 469-78 (1956).
NSA 11, 5645 (57)

- 631 V. V. Vladimirskii and E. K. Tarasov
The possibility of eliminating critical energy in a strong-focusing accelerator. AEC-tr-2267, 13 p. (1955). Translated from p. 13-22 in "Certain Problems of the theory of Cyclic Accelerators", Moscow; U.S.S.R. Academy of Sciences (1955).
NSA 10, 1588 (56)
- 632 V. V. Vladimirskii and E. K. Tarasov
On the possibility of dispensing with a critical energy in an accelerator with strong focusing. Moscow: U.S.S.R. Academy of Sciences, p. 13-22 (1955) (In Russian).
SA A59, 2939 (56) and SA B59, 1507 (56)
- 633 Vladimirsky, Komar, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Rubchinsky, Skachkov, Streltsov, and Tarasov
Basic features of a projected 50-60 Bev strong-focusing proton accelerator. Soviet J. Atomic Energy 4, 479-82 (1956).
NSA 11, 5644 (57)
- 634 Nils Vogt-Nilsen
A short survey of digital-computer results for radial motion in FFAG Mark V spiral-ridge accelerators. Midwestern Universities Research Assn., Urbana, Ill., and Illinois Univ., Urbana, MURA-NVN-4, 18 p. (1956).
NSA 10, 8695 (56)
- 635 R. K. Wakerling
Summary of the research progress meeting. California, Univ., Berkeley, Rad. Lab., RL-28.5.114, 5 p. (1946).
NSA 10, 2547 (56)
- 636 W. Walkinshaw
Preliminary design parameters for the 6.5 Bev S/R synchrotron. Atomic Energy Research Establishment, Harwell, England, TP/R 2063, 89 p. (1956).
CA 51, 5579c (57)
- 637 Robert H. West
Installation of the Bevatron power supply (thesis). California, Univ., Berkeley, Rad. Lab., UCRL-2968, 87 p. (1955).
NSA 9, 5167 (55)
- 638 C. Norman Winningstad
The rf system of the Bevatron. California, Univ., Berkeley, Rad. Lab., UCRL-2593, 35 p. (1954).
NSA 8, 6844 (54)
- 639 C. Norman Winningstad
Generating rf energies for a 6-Bev Bevatron. Electronics 28, No. 2, 164-9 (1955).
SA B58, 2523 (55)

- 640 B. T. Wright
Magnetic deflector for the Bevatron. *Rev. Sci. Instr.* 25, 425-31
(1954).
SA B57, 2959 (54)

ION SOURCE

- 641 Andrade, Losada, Fernandez, and Gómez
A radiofrequency ionization chamber. *Rev. Mexicana Fis.* 3, No. 2,
107-14 (1954) (In Spanish).
SA A58, 348 (55)
- 642 H. R. Allan and N. Sarma
An improved design of radiofrequency ion sources. *J. Sci. Instr.* 33,
447-8 (1956).
NSA 11, 1360 (57)
- 643 S. K. Allison and E. Norbeck, Jr.
Simplified radiofrequency ion source. *Rev. Sci. Instr.* 27, 285-8
(1956).
SA A59, 5162 (56)
- 644 C. E. Anderson and K. W. Ehlers
Ion source for the production of multiply charged heavy ions.
California, Univ., Berkeley, Rad. Lab., UCRL-3218, 31 p: (1955).
NSA 10, 3046 (56)
- 645 Jean de Beauregard
High-frequency ion source for generating 250-kv neutrons. *J. phys.*
radium 14, 547-8 (1953).
CA 48, 10442b (54)
- 646 L. Beckman
Experiments with an ion source having magnetic analysis of the ion
beam. *Arkiv. Fysik* 8, Paper No. 44, 451-6 (1956).
SA A58, 1925 (55)
- 647 F. Bertein and A. Pozwalski
On the analogy between the operation of ion sources and probes at
high frequencies. *Compt. rend.* 242, 2517-19 (1956) (In French).
SA A59, 6741 (56)
- 648 Bing, Gardner, and Northrop
Effect of a decelerating grid on current from an ion source. California,
Univ., Livermore, Rad. Lab., UCRL-4461, 13 p. (1955).
NSA 10, 10601 (56)

- 649 J. J. Burgerjon
New deuterium supply for cyclotron ion sources. *Rev. Sci. Instr.* 25, 522-3 (1954).
NSA 8, 4429 (54) and CA 48, 13448a (54)
- 650 Cornides, Roósz, and Siegler
Two lithium-ion sources for accelerators. I. *Nuclear Instr.* 1, 94 (1957).
NSA 11, 5640 (57)
- 651 K. K. Damodaran
Dissociation of molecular hydrogen ions (H_2^+) in gases. *Proc. Roy. Soc. (London)* A239, 382-93 (1957).
NSA 11, 5641 (57)
- 652 de Boer, Kley, and Makkink
Control and measurement of an ion source of a pressure-insulated Van de Graaff generator. *Rev. Sci. Instr.* 27, 614-18 (1956).
NSA 10, 11540 (56) and SA A59, 8247 (56)
- 653 Desjonquères, Geller, Prévot, and Vienet
The pulsing of an h.f. discharge with a zirconium filament. *J. phys. radium* 17, 166-7 (1956) (In French).
SA A59, 5128 (56)
- 654 J. Erö
The energy spectrum of the ion beam of a high-frequency ion source. *Acta phys. Hungar.* 5, 391-407 (1956) (In German).
SA A60, 1399 (57)
- 655 Harold P. Eubank
A high-yield radiofrequency ion source. *Phys. Rev.* 92, 853 (1953).
CA 49, 10073h (55)
- 656 Eubank, Peck, and Truell
Operating characteristics of a high-yield rf ion source. *Rev. Sci. Instr.* 25, 989-95 (1954).
SA A58, 347 (55)
- 657 J. S. Foster, Jr. and F. Martina
A low-voltage ion source. California, Univ., Berkeley, Rad. Lab., UCRL-1369, 42 p. (1951).
NSA 10, 11537 (56)
- 658 Gatti, Perona, and Persano
Pulse generator of neutrons. AEC-tr-1953, translated from *Nuovo cimento* (9) 10, 80-6 (1953) (In English).
NSA 9, 3307 (55)

- 659 R. Geller and F. Prevot
A source of doubly-ionized helium ions. *Compt. rend.* 238, 1578-80 (1954) (In French).
SA A57, 7503 (54)
- 660 J. D. Gow and J. S. Foster, Jr.
High-intensity pulsed ion source. *Rev. Sci. Instr.* 24, 606-10 (1953).
CA 48, 6271h (54)
- 661 Harry G. Heard
Arc cathode development. California, Univ., Berkeley, Rad. Lab.
UCRL-1222, 37 p. (1951).
NSA 11, 2744 (57)
- 662 H. Hintenberger and C. Lang
On a thermal ion-source with extremely low consumption of the substance. *Z. Naturforsch.* 11a, 167-8 (1956) (In German).
SA A59, 5961 (56)
- 663 Hoyaux, Lemaitre, and Gans
Theory and probe measurements in a magnetic ion source. *J. Appl. Phys.* 26, 110-12 (1955).
SA A58, 1929 (55)
- 664 Hoyaux, Lemaitre, and Gans
Measurements with probes in an oscillating-electron ion source. *J. phys. radium* 15, Suppl. to No. 5, 80A-84A (1954).
CA 48, 11907g (54) and SA A57, 9321 (54)
- 665 M. Hoyaux
Theory of oscillating-electron ion sources. *J. phys. radium* 15, 264-72 (1954) (In French).
SA A57, 9320 (54) and CA 48, 11179a (54)
- 666 R. J. Jones and A. Zucker
Two ion sources for the production of multiply charged nitrogen ions. *Rev. Sci. Instr.* 25, 562-6 (1954).
NSA 8, 4733 (54); SA A57, 9322 (54); and CA 48, 13491a (54)
- 667 Marc de Lacoste-Lareymondie
Operating conditions for a high-frequency ion source. *J. phys. radium* 15, 117-21 (1954).
CA 48, 13448i (54)
- 668 Lewis, Dain, Holmes, and Craston
An electron gun for use in a metre-wave high-power triode. Atomic Energy Research Establishment, Harwell, England, AERE-GP/M-168, 33 p. (1954).
NSA 8, 5042 (54)

- 669 C. B. Mills and C. F. Barnett
High-intensity ion source. Rev. Sci. Instr. 25, 1226-7 (1954).
SA A58, 1927 (55)
- 670 G. Mongodin
A tube for the continuous acceleration of ions under 200 kev. French
Commissariat à l'Energie Atomique, Paris, CEA-350, 82 p. (1954).
NSA 10, 4959 (56) and CA 50, 13624h (56)
- 671 V. M. Morozov
High-frequency ion source. Doklady Akad. Nauk S.S.S.R. 102, 61-4
(1955) (In Russian).
NSA 9, 5512 (55)
- 672 M. Pahl and W. Kleinmann
The homogeneous-energy ion stream from the glow of a hollow cathode.
Ann. Physik 13, 165-77 (1953).
CA 48, 9180c (54)
- 673 G. Perona and A. Persano
A model of a magnetic-field type deuteron source. Nuovo cimento
(10) 1, 501-3 (1955) (In Italian).
SA A58, 4745 (55)
- 674 J. A. Phillips and J. L. Tuck
Negative hydrogen-ion source. Rev. Sci. Instr. 27, No. 2, 97-8
(1956).
SA A59, 2955 (56)
- 675 F. Prévot and R. Vienet
Production of an intense pulsed beam of deuterons. J. phys. radium
16, 238 (1955) (In French).
NSA 9, 3666 (55); CA 49, 12979d (55); and SA A58, 6224 (55)
- 676 H. L. Reynolds and A. Zucker
Cyclotron ion source for the production of N^{3+} ions. Rev. Sci. Instr.
26, 894 (1955).
NSA 9, 7948 (55); SA A59, 423 (56); and CA 51, 877i (57)
- 677 O. A. Schaffer
An improved mass-spectrometer ion source. Rev. Sci. Instr. 25,
660-2 (1954).
CA 48, 1344g (54) and SA A57, 9323 (54)
- 678 J. Sommeria-Klein
Preliminary results of experiments with an annular ion source. J.
phys. radium 14, 555 (1953); cf CA 47, 2034d (1953).
CA 48, 10422h (54)

- 679 J. Sommeria-Klein
Construction of a 700 kv ion-accelerator tube. Development of oscillating-electron ion sources. *Ann. phys.* (13) 1, 344-94 (1956) (In French).
NSA 10, 9641 (56); SA A59, 6716 (56); and CA 51, 877e (57)
- 680 O. Specchio and A. Cambieri
A 560-e.kv particle accelerator. *Rend. ist. lombardo sci., Pt. I, Classe sci. mat. e nat.* 90, 14-22 (1956).
CA 51, 877d (57)
- 681 Troy E. Stone
Experiments on improving the efficiency of the Bevatron ion source. California, Univ., Berkeley, Rad. Lab., UCRL-3010, 38 p. (1955).
NSA 9, 5510 (55)
- 682 Warren F. Stubbins
An experimental ion source for the 184-inch cyclotron. California, Univ., Berkeley, Rad. Lab., UCRL-2698, 39 p. (1955).
NSA 9, 3662 (55)
- 683 Warren F. Stubbins
An experimental ion source for the 184-inch cyclotron. *Phys. Rev.* 98, 274-5 (1955).
CA 50, 10549d (54)
- 684 J. S. Swingle, Jr. and C. P. Swann
An rf ion source with transverse magnetic field. *Phys. Rev.* 87, 184 (1952).
CA 48, 8023i (54)
- 685 E. Thomas
Recent research concerning ion sources for accelerators. *Le Vide* 8, 1407-14 (1953).
CA 48, 6850d (54)
- 686 P. C. Thonemann and E. R. Harrison
A high-current proton source. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1190, 18 p. (1955).
NSA 9, 7160 (55) and SA A58, 9816 (55)
- 687 R. K. Wakerling and A. Guthrie
Source and collectors for use in calutrons. U. S. Atomic Energy Comm., TID-5218, 270 p. (1949).
CA 50, 3910g (56)
- 688 J. A. Weinman and J. R. Cameron
Negative hydrogen ion source. *Rev. Sci. Instr.* 27, 288-93 (1956).
SA A59, 5163 (56)

MISCELLANEOUS

- 689 J. H. Adlam and P. D. Dunn
Notes on coupled pill-box resonators operating in the π -mode. Atomic Energy Research Establishment, Harwell, England, AERE-GP/R-1539, 17 p. (1954).
NSA 9, 3987 (55)
- 690 V. S. Anastasevich
Theory of compensation of ion beams. Zhur. Tekh. Fiz. 26, 1487-92 (1956) (In Russian).
SA A60, 2324 (57)
- 691 S. E. Barden
Regenerative deflection as a parametrically excited resonance phenomenon. Rev. Sci. Instr. 25, 587-93 (1954).
NSA 8, 4734 (54); SA A57, 10262 (54); and SA B57, 5200 (54)
- 692 M. Bell
Twist resonances. Atomic Energy Research Establishment, Harwell, England, AERE-T/R-2077, 34 p. (1956).
NSA 11, 6130 (57)
- 693 I. J. Billington and W. R. Randorf
Electronic-ram experiments. Wireless Engr. 31, No. 11, 287-92 (1954).
SA B58, 744 (55)
- 694 E. Breitenberger
Diverging electrostatic lenses in accelerators. Nuclear Instr. 1, 55 (1957).
NSA 11, 4138 (57)
- 695 K. L. Brown and G. W. Taufest
Faraday-cup monitors for high-energy electron beams. Rev. Sci. Instr. 27, 696-702 (1956).
SA A60, 447 (57)
- 696 Bruck, Bronca, Hamelin, Neyret, and Parain
Correction of the constant-gradient field. AEC-tr-2641, translation of paper presented at CERN symposium 1956. 32 p.
NSA 11, 719 (57)
- 697 M. L. Bullock
Electrostatic strong-focusing lens. Amer. J. Phys. 23, 264-8 (1955).
SA A58, 5454 (55) and SA B58, 2566 (55)

- 698 S. Cohen and A. V. Crewe
Regenerative action in high-energy accelerators. *Nuclear Instr.* 1,
31-40 (1957).
NSA 11, 4137 (57)
- 699 Conference on physics of high-energy particles. (Tbilisi, S.S.S.R.,
October, 1956).
Uspekhi Fiz. Nauk S.S.S.R. 61, 103-28 (1957) (In Russian).
NSA 11, 6181 (57)
- 700 H. R. Crane
Maintaining the geometrical alignment of a large accelerator. Mid-
western Univ. Research Assn., Urbana, Ill., and Michigan Univ.,
Ann Arbor, MURA-HRC-1, 14 p. (1956).
NSA 10, 8016 (56)
- 701 A. Decae
Measurements on the site. European Council for Nuclear Research,
Proton Synchrotron Group, CERN-PS/AED-4, 29 p. (1955).
NSA 10, 5998 (56)
- 702 Daniel F. Dempsey
Third-order aberration and focusing with sector-shaped magnetic
fields. *Rev. Sci. Instr.* 26, 1141-5 (1955).
NSA 10, 2183 (56)
- 703 European Council for Nuclear Research
Investigation of nonlinear orbit theory. European Council for Nuclear
Research, CERN-PS/RH-1, 17 p. (1954).
NSA 8, 5061 (54)
- 704 W. Fishwick
Pulse modulation of an ion beam. *L'Onde Électrique* 34, 110-18 (1954).
SA A57, 11134 (54)
- 705 M. D. Gabovich
Effect of space charge during propagation of intense beams of charged
particles. *Uspekhi Fiz. Nauk* 56, 215-56 (1955) (In Russian).
NSA 9, 6780 (55)
- 706 C. S. Gardner
Charge distribution in the beam of charged particles in a constant
magnetic field. California Research and Development Co., Livermore
Research Lab., Livermore, Calif., LRL-122, 10 p. (56).
NSA 10, 8015 (56)
- 707 Konrad Grund (inventor) to Siemens-Reiniger-Werke A. G.
Apparatus for accelerating electrically charged particles, particularly
electrons. Ger. patent 823,165, Dec. 3, 1951 (Cl. 21g, 36).
CA 48, 6290e (54)

- 708 H. G. Hereward
Energy spread and phase focusing in particle accelerators. European Council for Nuclear Research, CERN-PS/HGH/1, 18 p. (1954).
NSA 8, 5372 (54)
- 709 C. B. Jones and R. B. Neal
Development of high-power modulators with low-voltage components. Stanford Univ., Calif., Microwave Lab., AECU-3129, 22 p. (1955).
NSA 10, 8011 (56)
- 710 P. Lévy
Chart for solution of a problem with electric or magnetic alternating-gradient lenses. J. phys. radium 17, Suppl. 6, 60A-61A (1956).
SA A60, 2325 (57)
- 711 Likhachev, Kutsenko, and Boronkov
The study of relativistic particles by the use of nuclear emulsions in a pulsed magnetic field. Soviet Phys. JETP 2, 766-7 (1956) (In English) and Zhur. Eksptl. i Teoret. Fiz. 29, 894-5 (1955) (In Russian).
NSA 10, 10605 (56)
- 712 Losada, Fernández, and Velázquez
A system of a potential stabilizer for accelerators of charged particles. Rev. mex. fis. 3, 115-22 (1954) (In Spanish).
NSA 8, 5964 (54) and SA A58, 330 (55)
- 713 Gerhart Lüders
On the description of the dynamic behaviour of laminated magnets by means of effective fields and an effective permeability. European Council for Nuclear Research CERN/PS/GL-13, 12 p. (1954).
NSA 9, 389 (55)
- 714 Kenneth R. MacKenzie
Calculator for some rf problems in accelerator design. Rev. Sci. Instr. 27, 580-3 (1956).
SA A60, 2323 (57)
- 715 C. W. Miller
Application of high energy electrons to the sterilization of pharmaceuticals and the irradiation of plastics. J. Brit. Instn. Radio Engrs. 14, 637-52 (1954).
SA B58, 4388 (55)
- 716 Moore, O'Briain, and Lindner
Physicochemical reactions of ionic beams. Indiana, Univ., Bloomington, Chemical Lab., NP-6023, 60 p. (1956).
NSA 10, 7018 (56)

- 717 Raymond Murray
Velocity and energy modulation by rf and g slits. Carbide and Carbon
Chemicals Corp., Y-12 Plant, Oak Ridge, Tenn., Y-B22-25, 9 p.
(1949).
NSA 11, 2747 (57)
- 718 B. D. Nag and A. M. Sayied
Electrodynamics of moving media and the theory of the Cerenkov
effect. Proc. Roy. Soc. (London) A235, 544-51 (1956).
NSA 10, 7025 (56)
- 719 Nuclear Engineering 1, 200-2 (1956)
C. E. R. N. --European Organization for Nuclear Research.
NSA 10, 11542 (56)
- 720 N. J. Palladine and C. E. Clifford, Jr.
Gamma-ray attenuation tests on steel plates and 1"-diameter steel
punchings. Oak Ridge Nat'l. Lab., M-4204, 7 p. (1947).
NSA 10, 4461 (56)
- 721 F. M. Piplein and D. R. Hamilton
Focusing atomic beam apparatus. Rev. Sci. Instr. 26, 1112-19 (1955).
CA 51, 6370g (57)
- 722 Reznik, Laforgerie, and Dupre
On a heavy-water electrolyser for the production of deuterium for use
in accelerators. Compt. rend. 244, 760-2 (1957) (In French).
SA A60, 5576 (57)
- 723 L. Riddiford
The importance of high vacua to high-energy nuclear physics. Vacuum
3, 231-44 (1953).
NSA 9, 5784 (55)
- 724 Leon A. Rovelsky
Interphase transformers for parallel inverters (thesis). California,
Univ., Berkeley, Rad. Lab., UCRL-2561, 61 p. (1954).
NSA 8, 6843 (54)
- 725 G. Sacerdoti
Study of the influence of the type of excitation on the configuration of
magnetic field in the air gap of a magnet. Electrotecnica 42, 212-16
(1955) (In Italian).
SA B58, 4781 (55)
- 726 F. Salzman and A. Roberts
On the effect of sector flare in fixed-field segmented accelerators.
Rochester, New York, Univ., NYO-7676, 23 p. (1956).
NSA 10, 12061 (56)

- 727 M. Sangster
Static field up to energies of several Mev. Appl. Sci. Research 4B,
261-70 (1955).
NSA 9, 5168 (55)
- 728 Solon, McLaughlin, and Blatz
Stray-radiation measurements at particle-accelerator sites. New
York Operations Office, Health and Safety Lab., AEC NYO-4699,
67 p. (1956).
NSA 10, 7019 (56)
- 729 P. A. Sturrock
Static and dynamic electron optics. An account of focusing in lens,
deflector, and accelerator. (The University Press, Cambridge,
1955), x + 240 p.
SA A59, 1284 (56)
- 730 Yu. V. Vandakurov
On some antisymmetrical magnetic fields with double focusing. Zhur.
Tekh. Fiz. 25, 2545-55 (1955) (In Russian).
NSA 10, 4961 (56)
- 731 V. I. Veksler
Coherent method of acceleration of particle bunches. European
Council for Nuclear Research, NP-6063, 16 p. (1956).
NSA 10, 10597 (56)
- 732 R. K. Wakerling
Magnetic linear shims for beam focusing. U. S. Atomic Energy
Comm., TID-5217, 37-126 (1949).
CA 50, 16189i (56)
- 733 R. K. Wakerling
Other magnetic shimming devices. U. S. Atomic Energy Comm.,
TID-5217, 127-61 (1949).
CA 50, 16189i (56)
- 734 R. K. Wakerling and A. C. Helmholtz
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CA 50, 16190d (56)
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Energy Comm., TID-5217, 162-209 (1949).
CA 50, 16190b (56)
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- Kato, T. -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Okano, Kato, Hu, and Koh).
- Katyshev -298 (with Dzhelepov, Dmitrievsky, Kozodaev, Mescheryakov, Tarakanov, and Chestnoi), 301 (with Efremov, Mescheryakov, Mints, Dzhelepov, Ivanov, Komar, Malyshev, Monoszon, Nevyaszhsy, Polyakov, and Chestnoi).
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- Kessler, J. -57.
- Kikuchi -337 (with Watatsuki, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh).
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- Koehler -279 (with Calame, Cooper, Engelsberg, Gerstein, Kuckes, Meadows, Strauch, and Wilson).
- Koga -93 (with Asada, Fujita, Furuta, Hiraoka, Masuda, Okamura, and Ookuma).
- Koh -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, and Hu).

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- Komar -301 (with Efremov, Mescheryakov, Mints, Dzhelepov, Ivanov, Katyshev, Malyshev, Monoszon, Nevyaszshsky, Polyakov, and Chestnoi), 630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Malyshev, Monoszon, Nevyazshsky, Petukhov, Rabinovich, Rubchinsky, Sinelnikov, and Stolov), 633 (with Vladimírsky, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Rubchinsky, Skachkov, Streltsov, and Tarasov).
- Kondo -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Ozaki, Kato, Okano, Kato, Hu, and Koh).
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- Kozodaev -298 (with Dzhelepov, Dmitrievsky, Katyshev, Mescheryakov, Tarakanov, and Chestnoi).
- Kratz -528 (with Jones, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies), 529 (with Jones, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies), 530 (with Jones, Lawson, Miller, Miller, Ragan, Rouvina, and Voorhies).
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- Kuckles -279 (with Calame, Cooper, Engelsberg, Gerstein, Koehler, Meadows, Strauch, and Wilson).
- Kulikov -536 (with Korolev, Markov, and Akimov).
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- Lafferty -61 (with Biggerstaff, Kern, and Hahn).
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Pepper, J. H. -308 (with W. S. Gilbert).
Perona, G. -14 (with A. Persano), 49 (with Gatti and Persano), 658 (with Gatti and Persano), 673 (with A. Persano).
Perry -116 (with Major and Phillips).
Persano, A. -14 (with G. Perona), 49 (with Gatti and Perona), 658 (with Gatti and Perona), 673 (with G. Perona).
Persico, E. -580, 581.
Peter, M. -78.
Peterson -408 (with Boyer, Hernandez, Putnam, Stahl, Taylor, and Thornton).
Petree, B. -108 (with R. S. Foote).
Petrie, D. P. R. -35 (with D. R. Chick).
Petrovich -372 (with Preskitt and Hamann).
Petrucci - 459 (with Denis, De Raad, Resegotti, and Sarazin), 460 (with Brianti, Denis, Germain, De Raad, Resegotti, Sarazin, and Stroot).
Petukhov -630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Rabinovich, Rubchinsky, Sinelnikov, and Stolov).
Phillips, J. A. -674 (with J. L. Tuck).
Phillips, K. -116 (with Major and Perry), 122.
Picard, E. -225.
Piccioni -582 (with Clark, Cool, Friedlander, and Kassner), 583 (with Clark, Cool, Friedlander, and Kassner), 584 (with Clark, Cool, Friedlander, and Kassner).

- Piche -63 (with Lorrain, Béique, Gilmore, Girard, and Breton).
Pickavance, T. G. -4 (with J. D. Cockcroft), 15 (with Skyrme and Stafford),
226, 227, 373.
Pidd -500 (with Hammer and Terwilliger).
Pinet, D. -79.
Pipkin, F. M. -721 (with D. R. Hamilton).
Plotkin -39 (with Cottingham and Raka), 454 (with Cottingham and Raka).
Polyakov -301 (with Efremov, Meshcheryakov, Mints, Dzheleпов, Ivanov,
Katyshev, Komar, Malyshev, Monoszon, Nevyaszhsy, and Chestnoi).
Pomerantz, M. A. -207 (with J. F. Marshall).
Ponce de Leon, J. M. -228.
Poole, M. J. -137 (with Allan, Carey, and McCahon), 229.
Post, R. F. -186 (with M. R. Jeppson), 230 (with N. S. Shiren), 231 (with
Shiren and Brown), 305 (with Gallop, Vonberg, Powell, Sharp, and
Waterton).
Pottier, J. -232, 233.
Powell, W. B. -305 (with Gallop, Vonberg, Post, Sharp, and Waterton), 374.
Pozwalski, A. -647 (with F. Bertein).
Preskitt -372 (with Petrovich and Hamann).
Prévot -69 (with Moreau and Vienet), 80 (with R. Vienet), 653 (with Geller,
Desjonquères, and Vienet), 659 (with R. Geller), 675 (with R. Vienet).
Pruett -105 (with Cole, Jones, and Terwilliger).
Purdue Research Foundation -585, 586.
Putnam, J. M. -6 (with F. E. Frost).
Putnam, T. -408 (with Boyer, Hernandez, Peterson, Stahl, Stahl, Taylor,
and Thornton).
Pyle, R. V. -335 (with Kelly, Thornton, Richardson, and Wright), 336 (with
Kelly, Thornton, Richardson, and Wright), 375, 376.

-Q-

- Quercia, I. F. -492 (with G. Ghigo).
Querzoli, R. -21 (with Ageno and Cortellessa).

-R-

- Rabinovich -342 (with Kolomenskii and Pelukhov), 630 (Veksler, Efremov,
Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky,
Komar, Malyshev, Monoszon, Nevyaszhsy, Petukhov, Rubchinsky,
Sinelnikov, and Stolov).
Ragan -528 (with Jones, Kratz, Lawson, Miller, Miller, Rouvina, and
Voorhies), 529 (with Jones, Kratz, Lawson, Miller, Miller, Rouvina,
and Voorhies), 530 (with Jones, Kratz, Lawson, Miller, Miller, Rouvina,
and Voorhies).
Raka -39 (with Cottingham and Plotkin), 454 (with Cottingham and Plotkin).
Rakic, M. -66 (with B. Marsicanin).
Ramler -294 (with Delbecq, Rocklin, and Yuster).
Ramm, C. M. -587, 588 (with Coe and Vaughan).
Randorf, W. R. -693 (with I. J. Billington).
Rankin -360 (with Martin, Livingston, and Murray).
Regenstreif, E. -589, 590, 591, 592, 593, 594.
Resegotti -459 (with Denis, De Raad, Petrucci, and Sarazin), 460 (with
Brianti, Denis, Germain, De Raad, Petrucci, Sarazin, and Stroot).

Reynolds, H. L. -377 (with A. Zucker), 676 (with A. Zucker).
Reznik -722 (with Laforgerie and Dupré).
Rhody, R. B. -378.
Ribe, F. L. -379.
Richardson, J. E. -123 (with Van Roosenbeek and Morgan).
Richardson, J. R. -335 (with Kelly, Pyle, Thornton, and Wright), 336 (with Kelly, Pyle, Thornton, and Wright).
Richman -23 (with Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, and Woodyard), 138 (with Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, and Woodyard).
Riddiford, L. -543 (with B. Ledley), 564 (with Moon and Symonds), 595 (with van de Raay and Coe), 723.
Ridley, R. O. -234.
Roberts, A. -726 (with F. Salzman).
Robertson -168 (with Dazey, Nielsen, and Sewell).
Rocklin -294 (with Delbecq, Ramler, and Yuster).
Rogers, E. J. -81.
Roosz -650 (with Cornides and Siegler).
Rosenbaum, E. P. -16.
Ross, M. -261 (with W. Walkinshaw).
Rossi, G. B. -380.
Rotblat, J. -235.
Rouse -281 (with Caro and Martin).
Rouvina -528 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Voorhies), 529 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Voorhies), 530 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Voorhies).
Rovelsky, L. A. -724.
Rubchinsky -630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyszsky, Petukhov, Rabinovich, Sinelnikov, and Stolov), 633 (with Vladimirsky, Komar, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Skachkov, Streltsov, and Tarasov).
Rubich, N. B. -8 (with A. A. Kolomenskii).
Ruby, L. -315 (with Heusinkveld, Jakobson, and Wright), 316 (with Jakobson, Heusinkveld, Smith, and Wright), 321 (with Jakobson and Heusinkveld), 381 (with Heusinkveld, Jakobson, Smith, and Wright).
Rudolph -354 (with Livingston and Howard).

-S-

Sabel -262 (with Walkinshaw and Outram), 263 (with Walkinshaw and Outram).
Sabsovich, L. L. -535 (with A. A. Kolomenskii).
Sacerdoti, G. -725.
Sakisaka -194 (with Kimura and Miyashiro).
Saldick, J. -71 (with A. J. Moses).
Salin -203 (with Leuba, Thibaud, and Verzaux), 258 (with Thibaud and Verzaux), 626 (with Thibaud and Verzaux).
Salvini, G. -596, 597, 598, 599.
Salzman, F. -726 (with A. Roberts).
Sanada -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh).

Sands, M. -600.
 Sangster, M. -727.
 Sarazin -459 (with Denis, De Raad, Petrucci, and Resegotti), 460 (with Denis, Germain, Brianti, De Raad, Petrucci, Resegotti, and Stroot).
 Sarma, N. -642 (with H. R. Allan).
 Sasson, G. -601.
 Saxon, D. S. -568 (with J. S. Nodvick), 569 (with J. S. Nodvick).
 Saxon, G. -236.
 Sayied, A. M. -718 (with B. D. Nag).
 Scag, D. T. -124.
 Schaffer, O. A. -677.
 Schelberg -199 (with Kitchen, Hill, and Smits).
 Schittenhelm, R. -125, 126 (with J. Urlaub).
 Schmidt, F. H. -320 (with M. J. Jakobson), 382 (with Farwell, Henderson, Morgan, and Strieb).
 Schmidt, G. -59 (with Kostka and Mérey).
 Schmouker, J. -27 (with R. Barjon).
 Schoch, A. -602.
 Schopper -55 (with Janner and Magun).
 Schrader, E. F. -134 (with R. M. Warner, Jr.).
 Schrank, G. E. -383, 384.
 Schuhl, C. -99 (with R. Basile).
 Schuldt, S. -190 (with L. H. Johnston).
 Schuler, R. H. -385 (with A. O. Allen), 386 (with A. O. Allen).
 Schwemin, A. J. -285 (with S. A. Colgate).
 Seiden, J. -603, 604, 605, 606, 607, 608, 609, 610 (with F. Lurcat).
 Seidl, M. -127, 611.
 Sellen, J. M., Jr. -565 (with M. J. Moravcsik).
 Septier, A. -237, 238, 239, 240.
 Seren -100 (with Birnbaum, Harth, and Tobin), 101 (with Birnbaum, Harth, and Tobin), 128 (with Birnbaum, Harth, and Tobin).
 Servranckx, R. -241, 242.
 Sessler, A. M. -400 (with K. R. Symon), 531 (with Kerst, Cole, Crane, Jones, Laslett, Ohkawa, Symon, Terwilliger, and Vogt-Nilsen), 623 (with K. R. Symon).
 Sewell -168 (with Dazey, Nielsen, and Robertson).
 Shamshev -202 (with Lapitskii, Levintov, and Slivkov).
 Sharp -305 (with Gallop, Vonberg, Post, Powell, and Waterton).
 Shersby-Harvie, R. B. -243, 244 (with Mullett, Walkinshaw, Bell, and Loach), 245 (with Mullett, Walkinshaw, Bell, and Loach).
 Shiren -231 (Post and Brown), 230 (R. F. Post).
 Shuf -25 (with Baev, Vorotnikov, Gokhberg, Sidorov, and Yan'kov), 26 (with Baev, Vorotnikov, Gokhberg, Sidorov, and Yan'kov).
 Shull -387 (with MacFarland and Bretscher).
 Shutt -488 (with Fowler, Thorndike, and Whittemore).
 Siddal -92 (with Allen and Ashworth).
 Sidorov -25 (with Baev, Vorotnikov, Gokhberg, Shuf, and Yan'kov), 26 (with Baev, Vorotnikov, Gokhberg, Shuf, and Yan'kov).
 Siegler -650 (with Cornides and Roósz).
 Sigurgeirsson, T. -612, 613.
 Šimáně, Č. -129.
 Simon, A. W. -82.
 Simon, G. P. -50 (with Godsinn, Solomon, and Weber).
 Simonyi, K. -17.

- Sinelnikov -630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyazhsky, Petukhov, Rabinovich, Rubchinsky, and Stolov).
- Sittkus -449 (with Citron and Gentner).
- Skachkov -633 (with Vladimírsky, Komar, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Rubchinsky, Streltsov, and Tarasov).
- Skaggs -246 (Nygard and Lanzl).
- Skarsgard -130 (with Cormack and Johns).
- Skyrme -15 (with Pickavance and Stafford).
- Slater -151 (with Blackstock and Birkhoff).
- Slivkov -202 (with Lapitskii, Levintov, and Shamshev).
- Smars, E. A. -247, 248, 614 (with O. Wernholm).
- Smith, B. H. 316 (with Heusinkveld, Jakobson, Ruby, and Wright), 381 (with Ruby, Heusinkveld, Jakobson, and Wright), 388, 389, 390, 391 (with K. R. MacKenzie).
- Smith, L. -161 (with Clark, Jopson, Lamb, and Van Atta), 179 (with M. Good), 180 (with M. Good), 249 (with R. L. Gluckstern), 250 (with R. L. Gluckstern), 615.
- Smits -199 (with Kitchen, Schelberg, and Hill).
- Sokolov -616 (with Ternov and Strakhovskii).
- Solomon -50 (with Godsin, Simon, and Weber).
- Solon -728 (with McLaughlin and Blatz).
- Solov'ev, L. S. -447 (with E. L. Burshtein).
- Sommeria-Klein, J. -251, 678, 679.
- Spaa, J. H. -85 (with A. C. van Dorsten).
- Spechio, O. -83 (with A. Cambieri), 252 (with A. Cambieri), 680 (with A. Cambieri).
- Spicer, B. M. -131 (with A. S. Penfold).
- Spiers, V. M. -303 (with J. H. Fremlin).
- Stafford -15 (with Pickavance and Skyrme).
- Stähelin, P. -274 (with Bluemel and Carroll), 392.
- Stahl, B. -408 (with Boyer, Hernandez, Peterson, Putnam, Stahl, Taylor, and Thornton).
- Stahl, R. -408 (with Boyer, Hernandez, Peterson, Putnam, Stahl, Taylor, and Thornton).
- Stamm, H. -18.
- Stanford University -253, 254.
- Steinhaus -220 (with Old and Wright).
- Steinwedel, H. -132, 393, 617.
- Stephan, W. J. -394.
- Stephens -411 (with Walker, Fremlin, and Link).
- Stolov -630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyazhsky, Petukhov, Rabinovich, Rubchinsky, and Sinelnikov).
- Stone, T. E. -681.
- Strakhovskii -616 (with Sokolov and Ternov).
- Straub -34 (with Bumiller, Meyer, and Winkler).
- Strauch -279 (with Calame, Cooper, Engelsberg, Gerstein, Koehler, Kuckes, Meadows, and Wilson).
- Streltsov -633 (with Vladimírsky, Komar, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Rubchinsky, Skachkov, and Tarasov).
- Strieb -382 (with Farwell, Henderson, Morgan, and Schmidt).
- Stroot -460 (with Brianti, Denis, Germain, De Raad, Petrucci, Resegotti, and Sarazin).

- Strumski -84 (with Cooper, Frisch, and Zimmerman).
Struven, W. C. - 441 (with W. M. Brobeck), 618.
Stubbins, W. F. -255, 256, 288 (with F. S. Crawford, Jr.), 395, 396, 397,
619, 620, 621, 682, 683.
Sturm, W. J. -398 (with R. J. Jones).
Sturrock, P. A. -729.
Swann, C. P. -684 (with J. S. Swingle, Jr.).
Swingle, J. S., Jr. -684 (with C. P. Swann).
Symon -399 (with Jones, Kerst, Laslett, and Terwilliger), 400 (with
A. M. Sessler), 531 (with Kerst, Cole, Crane, Jones, Laslett, Ohkawa,
Sessler, Terwilliger, and Vogt-Nilsen), 622 (with Kerst, Jones, Laslett,
and Terwilliger), 623 (with A. M. Sessler).
Symonds -564 (with Moon and Riddiford).

-T-

- Taieb, J. -48 (with A. Gabet), 624 (with Guillon, Gabet, and Mey).
Takeda -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yamabe,
Yoshizawa, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato,
Hu, Okano, Kato, and Koh).
Tarakanov -298 (with Dzhelepov, Dmitrievsky, Katyshev, Kozodaev,
Meshcheryakov, and Chestnoi).
Tarantin -312 (with Druin, Filippova, Gerlit, Guseva, and Myasoedov).
Tarasov, E. K. -631 (with V. V. Vladimirkii), 632 (with V. V. Vladimirkii),
633 (with Vladimirkii, Komar, Mints, Goldin, Koshkarev, Monoszon,
Nikitin, Rubchinsky, Skachkov, and Streltsov).
Tautfest, G. W. -695 (K. L. Brown).
Taylor, A. E. -401, 402, 403, 404, 405.
Taylor, C. J. -408 (with Boyer, Hernandez, Peterson, Putnam, Stahl, Stahl,
and Thornton).
Teng, L. C. -133, 257, 406, 407, 625.
Ternov -616 (Sokolov and Strakhovskii).
Terwilliger -105 (with Cole, Jones, and Pruett), 325 (with Jones and Haxby),
399 (with Jones, Kerst, Laslett, and Symon), 500 (with Hammer and
Pidd), 531 (with Kerst, Cole, Crane, Jones, Laslett, Ohkawa, Sessler,
Symon, and Vogt-Nilsen), 622 (with Symon, Kerst, Jones, and Laslett).
Thibaud -203 (with Salin, Leuba, and Verzaux), 258 (with Verzaux and Salin),
626 (with Verzaux and Salin).
Thomas, E. -685.
Thompson -171 (with Dunn and Hadden).
Thonemann, P. C. -686 (with E. R. Harrison).
Thorndike -488 (with Fowler, Shutt, and Whittemore).
Thornton -335 (with Kelly, Pyle, Richardson, and Wright), 336 (with Kelly,
Pyle, Richardson, and Wright), 408 (with Boyer, Hernandez, Peterson,
Putnam, Stahl, Stahl, and Taylor).
Timm, U. -73 (with H. Neuert).
Tobin -100 (with Birnbaum, Harth, and Seren), 101 (with Birnbaum, Harth,
and Seren), 128 (with Seren, Birnbaum, and Harth).
Tomboulian, D. H. -627 (with P. L. Hartman), 628 (with P. L. Hartman).
Trainor, L. E. H. -629 (with S. B. Brown).
Truell -656 (with Eubank and Peck).
Trump -51 (with Goldie, Wright, Anson, and Cloud).
Tuck, J. L. -674 (with J. A. Phillips).

-U-

Ueyanagi -193 (with Kimura, Kumabe, Nakatsu, and Kusumegi).
Uhlmann, E. M. -184 (with C. L. Hsieh), 259 (with C. L. Hsieh).
Uridge, F. -299 (with A. O. Edmunds).
Urlaub, J. -126 (with R. Schittenhelm).

-V-

Van Atta -161 (with Clark, Jopson, Lamb, and Smith).
Vandakurov, Y. V. -730.
Van de Raay -595 (with Riddiford and Coe).
Van Dorsten, A. C. -85 (with J. H. Spaa).
Van Roosenbeek -123 (with Richardson and Morgan).
Varshni, Y. P. -409.
Vaughan -588 (with Ramm and Coe).
Veisbin -630 (with Veksler, Efremov, Mints, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyszhsy, Petukhov, Rabinovich, Rubchinsky, Sinelnikov, and Stolov).
Veksler, V. I. -1 (with Burshtein and Kolomenskii), 2 (with Burshtein and Kolomenskii), 19, 630 (with Efremov, Mints, Veisbin, Bodopyanov, Gashev, Zeidlits, Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyszhsy, Petukhov, Rabinovich, Rubchinsky, Sinelnikov, and Stolov), 731.
Velázquez -712 (with Losada and Fernández).
Verzaux -203 (with Leuba, Salin, and Thibaud), 258 (with Thibaud and Salin), 626 (with Thibaud and Salin).
Vienet, R. -69 (with Moreau and Prévot), 80 (with F. Prévot), 653 (with Desjonquières, Geller, and Prévot), 675 (with F. Prévot).
Vladimirskii, V. V. -631 (with E. K. Tarasov), 632 (with E. K. Tarasov), 633 (with Komar, Mints, Goldin, Koshkarev, Monoszon, Nikitin, Rubchinsky, Skachkov, Streltsov, and Tarasov).
Vogt-Nilsen -531 (with Kerst, Cole, Crane, Jones, Laslett, Ohkawa, Sessler, Symon, and Terwilliger), 634.
Vonberg -305 (with Gallop, Post, Powell, Sharp, and Waterton).
Von Dardel, G. F. -153 (with E. Blomsjo).
Voorhies -528 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Rouvina), 529 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Rouvina), 530 (with Jones, Kratz, Lawson, Miller, Miller, Ragan, and Rouvina).
Vorotnikov -25, 26.

-W-

Wajima -109 (with Kamhara, Imai, and Kimura).
Wakerling, R. K. -260, 410 (with A. Guthrie), 635, 687 (with A. Guthrie), 732, 733, 734 (with A. C. Helmholz), 735 (with H. F. Weaver).
Walker -411 (with Fremlin, Link, and Stephens).
Walkinshaw, W. -20, 144 (with M. Bell), 244 (with Bell, Loach, Mullett, and Shersby-Harvie), 245 (with Bell, Loach, Mullett, and Shersby-Harvie), 261 (with M. Ross), 262 (with Sabel and Outram), 263 (with Sabel and Outram), 412 (with N. M. King), 636.
Wall, N. S. -413 (with J. W. Irvine, Jr.).

- Warner, R. M., Jr. -134 (with E. F. Schrader).
Watatsuki -337 (with Kikuchi, Yamaguchi, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh).
Waterton -305 (with Gallop, Vonberg, Post, Powell, and Sharp).
Weaver, H. F. -735 (with R. K. Wakerling).
Weber -50 (with Godsin, Simon, and Solomon).
Weeber -118 (with Moller and Grimm).
Weeks, R. R. -86.
Weinman, J. A. -688 (with J. R. Cameron).
Weinstock, E. V. -135 (with J. Halpern).
Weir, R. A. -264.
Wenzel, W. A. -13 (with W. K. H. Panofsky).
Wernholm, O. -614 (with E. Smars).
West, R. H. -637.
Westendorp -97 (with Baldwin and Elder).
Whitby, H. C. -87.
Whittemore -488 (with Fowler, Shutt, and Thorndike).
Wilcox, J. M. -88.
Wilkins, J. J. -265, 736.
Williams, J. H. -191 (with Johnston and Day).
Wilson -279 (with Calame, Cooper, Engelsberg, Gerstein, Koehler, Kuckes, Meadows, and Strauch).
Winkler -34 (with Bumiller, Meyer, and Straub).
Winningstad, C. N. -638, 639.
Winter, S. D. -89.
Witt, F. E. L. -357 (with D. E. Mapother).
Wolicki -43 (with Dunning, Bondelid, Fagg, and Kennedy).
Woodyard -23 (with Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, and Richman), 138 (with Alvarez, Bradner, Franck, Gordon, Gow, Marshall, Oppenheimer, Panofsky, and Richman).
Wootton, P. -90.
Worsham -297 (with Donaldson and Ziegler).
Wouters, L. F. -414.
Wright, B. T. -315 (with Heusinkveld, Jakobson, and Ruby), 316 (with Smith, Heusinkveld, Jakobson, and Ruby), 335 (with Kelly, Pyle, Thornton, and Richardson), 336 (with Kelly, Pyle, Thornton, and Richardson), 381 (with Ruby, Heusinkveld, Jakobson, and Smith), 640.
Wright, K. A. -51 (with Goldie, Anson, Cloud, and Trump).
Wright, R. E. -220 (with Old and Steinhaus).

-Y-

- Yager -306 (with Galt and Dail).
Yamabe -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh).
Yamaguchi -337 (with Kikuchi, Watatsuki, Oda, Sanada, Yamabe, Yoshizawa, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki, Kato, Okano, Kato, Hu, and Koh).
Yamashita, S. -339 (with J. Kokame).
Yan'kov -25 (with Baev, Vorotnikov, Gokhberg, Sidorov, and Shuf), 26 (with Baev, Vorotnikov, Gokhberg, Sidorov, and Shuf).

Yockey, H. P. -415.

Yonts, O. -266 (with S. Bashkin).

Yoshizawa -337 (with Kikuchi, Watatsuki, Yamaguchi, Oda, Sanada,
Yamabe, Takeda, Nozawa, Okada, Hirao, Kabayashi, Kondo, Ozaki,
Kato, Okano, Kato, Hu, and Koh).

Yuster -294 (with Delbecq, Ramler, and Rocklin).

-Z-

Zaffarano, D. J. -104 (with Fureau and Austerheim), 427 (with G. Anderson),
445 (with Bureau and Austerheim), 446 (with Bureau and Austerheim),
561 (with L. R. McMurray).

Zeidlits -630 (with Veksler, Efremov, Mints, Veisbin, Bodopyanov, Gashev,
Ivanov, Kolomensky, Komar, Malyshev, Monoszon, Nevyszhsy, Petukhov,
Rabinovich, Rubchinsky, Sinelnikov, and Stolov).

Ziegler, N. F. -297 (with Donaldson and Worsham), 416, 417, 418.

Zimmerman -84 (with Strumski, Cooper, and Frisch).

Zucker, A. -377 (with H. L. Reynolds), 666 (with R. J. Jones), 676 (with
H. L. Reynolds).

PARTICLE ACCELERATORS

II. LIST OF ACCELERATOR INSTALLATIONS

Gerald A. Behman

Radiation Laboratory
University of California
Berkeley, California

January 1, 1958

INTRODUCTION

This list is intended to include data on all accelerators throughout the world and supersedes similar lists by Bonnie E. Cushman in UCRL-1238 (March, 1951), by Sergey Shewchuck in UCRL-1951 (September, 1952), and by Frederick E. Frost and Jane M. Putnam in UCRL-2672 (November, 1954).

Data presented here have been acquired in most instances by direct response to a questionnaire sent by the author to the individual installations or, in the case of some foreign countries, to the scientific attachés of the various embassies. In a few cases, it was necessary to acquire the data indirectly through the technical literature or by reference to manufacturers' data.

Of the 411 questionnaires sent out, 224 went to installations in the United States, while 187 went to other countries. Replies were received from 89% of the installations polled in the United States, and from 74% of the foreign installations. Questionnaires submitted to Argentina, Brazil, Chile, China, Mexico, Rumania, and Turkey were not answered.

A time interval of ten months was arbitrarily set for response to the questionnaire. In some instances, not all of the desired information was furnished on the returned questionnaire; these cases are indicated in the list by n. a. (not available).

For rapid and ready reference, the information is classified, first, according to the type of accelerator and, second, according to the address of the installation. Each accelerator group is grossly separated into those machines located in the United States and those located elsewhere in the world.

The general types of accelerators included are direct-current (dc) machines, induction machines, and resonance accelerators. The dc machines comprise cascade rectifiers (Cockcroft-Walton), electrostatic generators (Van de Graaff), and certain transformer-rectifier combinations. The primary example of an accelerator operating on the principle of induction is the betatron. Resonance accelerators include both traveling- and standing-wave linear accelerators as well as magnetic accelerators of the cyclotron or synchrotron type. In this survey, the category cyclotron includes continuous-wave (CW) and frequency-modulated (FM) machines. The synchrotron group includes proton, electron, and fixed-field alternating-gradient (FFAG) machines.

For the convenience of the reader, the distribution of these machines throughout the world is summarized by type of accelerator and country in Table I. The distribution of types of establishments having accelerators in the United States is analyzed in Table II according to type of machine and primary activity of the organization.

Every effort has been made to avoid duplication or omission of information. The author will appreciate notification of such errors.

Table I
Distribution of Machines, by Type and Country

	D. C. Machines	Induction Machines		Resonance Machines		
		Betatrons	Linear Accelerators	Magnetic Accelerators	Cyclotrons	
					Synchrotrons	Synchrotrons
United States	133	38	32	38	15	
Outside the United States	130	32	25	32	24	
Argentina				1		
Australia				2	3	
Belgium	7		3	1		
Brazil		1				
Canada	8	2	1	2	1	
Denmark	3			1		
Formosa	1					
France	15	2	4	1	1	
Germany	8	4		2	2	
Great Britain	26	3	15	8	5	
India	2					
Iran	1					
Israel	1			1		
Italy	5	2			1	
Japan	17	11	1	5	6	
Mexico	1					
Netherlands	5			1		

Table I (cont.)

D. C. Machines		Induction Machines	Resonance Machines		
			Betatrions	Linear Accelerators	Magnetic Accelerators
				Cyclotrons	Synchrotrons
New Zealand		1			
Norway	6	1			
Poland	1				
Portugal	1				
Spain	2				
Sweden	7	2		3	1
Switzerland	5	2	1		2
Union of South Africa	1			1	
Union of Soviet Socialist Republics	3			2	1
Yugoslavia	4	1		1	

Table II

Distribution of establishments reporting accelerators in the United States according to type of machine and activity

Type of Machine	Type of Establishment						Total
	Colleges and Universities	Federal Government	Hospitals	Private Firms	Nonprofit Organizations		
D. C. Machines	31	11	9	33	4		88
Betatrions	9	7	5	14	0		35
Linear Accelerators	14	1	3	2	1		21
Cyclotrons	20	2	0	1	1		24
Synchrotrons	13	1	0	1	0		15
Total	87	22	17	51	6		183

Note: AEC contractors are classified according to the type of establishment holding the contract.

LIST OF ACCELERATOR INSTALLATIONS

I. Direct Current Machines

In the United States

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Argonne Cancer Research Hospital, University of Chicago, Chicago, Ill.	Van de Graaff	7-ft tank length	e	2
¹ Argonne National Laboratory, Lemont, Ill.	Van de Graaff	18-ft accelerating tube	p, d	3.6
	Van de Graaff	9-ft tank length	e	1.0
¹ Arkansas, University, Fayetteville, Ark.	High-voltage rectifier	~10-ft accelerating tube	p, d, α	0.4
¹ Atomics International, Canoga Park, Calif.	Van de Graaff	4-ft accelerating tube	e	1.6

* Under construction

- ¹ Information obtained from response to questionnaire.
- ² Information from High Voltage Engineering Company, Burlington, Massachusetts.
- ³ Information from E. H. Krause, Particle Accelerators, in American Institute of Physics Handbook (McGraw-Hill, New York, 1957), p 8-184 to 8-201.
- ⁴ Information from Allis-Chalmers Company, Milwaukee, Wisconsin.
- ⁵ Information from Varian Associates, Palo Alto, California.
- ⁶ Information from W. K. H. Panofsky, Some Comments on Soviet Physics Based on a Visit of 14-26 May, 1956. Internal Memorandum, High-Energy Physics Laboratory, Stanford University, Stanford, California, May 31, 1956.
- ⁷ E. P. Rosenbaum, Physics in the U.S.S.R., Sci. American 195, No. 2, 29 (1956).

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
² Austenai, Inc., Chicago, Ill	Van de Graaff	n. a.	x-rays	1
² Babcock and Wilcox, Lynchburg, Va.	Van de Graaff	n. a.	x-rays	1
² Union Carbide and Carbon Corp., Bakelite Division, Bloomfield, N. J.	Van de Graaff	n. a.	e	2
¹ Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa.	Cockcroft-Walton	4-ft accelerating tube	d	0.135
	Van de Graaff	21-ft accelerating tube	p	5.5
	Van de Graaff	6-ft accelerating tube	d	1.7
² Baylor University, College of Medicine, Houston, Tex.	Van de Graaff	n. a.	x-rays	2
^{1, 2} Bell Telephone Laboratories, New York, N. Y.	Van de Graaff	n. a.	e	1
	*Van de Graaff	n. a.	e	1
^{1, 2} Brookhaven National Laboratory, Upton, Long Island, N. Y.	Van de Graaff	8-ft accelerating tube	p, d, He ³ , α	4
	Van de Graaff	3-ft accelerating tube	e	2
	Van de Graaff	3-ft accelerating tube	e	2
	Van de Graaff	12-ft accelerating tube	p	4
¹ California Institute of Technology, Pasadena, Calif.	Van de Graaff	2.25-ft accelerating tube	p, d, α, He ³	0.6
	Van de Graaff	8-ft accelerating tube	p, d, α, He ³	1.8
	Van de Graaff	9-ft accelerating tube	p, d, α, He ³	3.0
² California Research Corporation, Richmond, Calif.	Van de Graaff	n. a.	e	2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ California, University, Radiation Laboratory, Berkeley, Calif.	Cockcroft-Walton	4-ft accelerating tube	p	0.5
	Cockcroft-Walton	4-ft accelerating tube	gaseous ions	0.5
	Van de Graaff	27-ft tank length	p, d, α	4
¹ California, University, Radiation Laboratory, Livermore, Calif.	Van de Graaff	1.7-ft accelerating tube	p, d	1
	Cockcroft-Walton	6-ft accelerating tube	p, d, α	0.5
¹ Carnegie Institution of Washington, Washington, D. C.	Van de Graaff	n. a.	α	7
² Chicago Bridge and Iron Company, Birmingham, Ala.	Van de Graaff	n. a.	x-rays	2
	Van de Graaff	n. a.	x-rays	1
¹ Chicago, University, Chicago, Ill.	Cockcroft-Walton	7.5-ft accelerating tube	p, d	0.45
³ College of Agriculture and Mechanics, Ames, Ia.	Cockcroft-Walton	5-ft accelerating tube	p, d, α	0.3
¹ Columbia University, Pupin Cyclotron Laboratories, New York, N. Y.	Van de Graaff	12-ft accelerating tube	p, d, α	6.5
¹ Connecticut, University, Storrs, Conn.	Cockcroft-Walton	3-ft accelerating tube	positive ions	0.25
² Cooper Alloy Corporation, Hillside, N. Y.	Van de Graaff	n. a.	x-rays	1
² Cornell University, Ithaca, N. Y.	Van de Graaff	n. a.	e	2
¹ Dow Chemical Company, Midland, Mich.	Van de Graaff	4.6-ft accelerating tube	p, d, e	2
	Van de Graaff	n. a.	e	2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Dow Chemical Company, Western Division, Pittsburg, Calif.	Van de Graaff	n. a.	e	2.5
¹ Duke University, Durham, N. C.	Van de Graaff	25-ft tank length	p, d, α	4
² E. I. DuPont de Nemours, Inc., Wilmington, Del.	Van de Graaff	n. a.	e	2
	Van de Graaff	n. a.	e	3
² Eugene Talmadge Memorial Hospital, Augusta, Ga.	Van de Graaff	2.7-ft accelerating tube	x-rays	2
¹ Ethicon, Inc., Somerville, N. J.	Van de Graaff	n. a.	e	2.5
¹ Evans Signal Laboratory, Belmar, N. J.	Van de Graaff	n. a.	p, d, e	2
¹ Florida, University, Gainesville, Fla.	Van de Graaff	5-ft accelerating tube	p, d	1
² Florida State University, Tallahassee, Fla.	Van de Graaff (tandem)	n. a.	p, α	10
¹ Foster-Wheeler Corporation, Mountaintop, Pa	Van de Graaff	3.7-ft accelerating tube	x-rays	2
¹ General Electric Company, Hanford Laboratories, Richland, Wash.	Van de Graaff	5.3-ft tank length	e	2.0
	Van de Graaff	6.3-ft tank length	p, d	2.0
¹ General Electric Company, Aircraft Nuclear Propulsion Department, Cincinnati, O.	Van de Graaff	3.6-ft accelerating tube	e	2
¹ Arnold Greene, Inc., Cambridge, Mass.	Van de Graaff	n. a.	x-rays	1
² Gulf Research and Development Company, Pittsburg, Pa.	Van de Graaff	n. a.	p, d, α, e	3

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Humble Oil and Refining Company, Houston, Tex.	Van de Graaff	3.25-ft accelerating tube	e	2
¹ Iowa State University, Iowa City, Ia.	Cockcroft-Walton	5-ft accelerating tube	p, d, α	0.5
	Van de Graaff	20-ft accelerating tube	p, d, α	4
² Johns Hopkins University, Baltimore, Md.	Van de Graaff	6-ft accelerating tube	p, d	3
¹ Kansas, University, Lawrence, Kan.	Van de Graaff	7-ft accelerating tube	p, d	3
¹ Kentucky, University, Lexington, Ky.	Van de Graaff	7.5-ft accelerating tube	p, d	2.2
	Cockcroft-Walton	2-ft accelerating tube	d	0.12
¹ Lemuel Shattuck Hospital for Chronic Diseases, Boston, Mass.	Van de Graaff	n.a.	x-rays	2
¹ Lockheed Aircraft Corporation, Missile Systems Division, Palo Alto, Calif.	Van de Graaff	3.5-ft accelerating tube	p, d, α	3
¹ Los Alamos Scientific Laboratory, Los Alamos, N. Mex.	Cockcroft-Walton	6.3-ft accelerating tube	p, d	0.50
	Cockcroft-Walton	3.3-ft accelerating tube	p, d	0.25
	Van de Graaff	20-ft accelerating tube	p, d, α	8
	Van de Graaff	5-ft accelerating tube	p, d, t, He ³ , α	2.5
	Van de Graaff	5-ft accelerating tube	p, d, t, He ³ , α	2.5
² Los Angeles Tumor Clinic, Los Angeles, Calif.	Van de Graaff	3-ft accelerating tube	x-rays	2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Magnolia Petroleum Company, Dallas, Tex.	Van de Graaff	1.2-ft accelerating tube	p, d	0.5
	Van de Graaff	3-ft accelerating tube	p, d, He ³ , α	2
¹ Massachusetts Institute of Technology, Laboratory for Nuclear Science, Cambridge, Mass.	Van de Graaff	18-ft accelerating tube	p, d, α	8.5
	Van de Graaff	9-ft accelerating tube	p, d	4
² Massachusetts General Hospital, Boston, Mass.	Van de Graaff	2.7-ft accelerating tube	x-rays	2.0
² Mellon Institute, Pittsburgh, Pa.	Van de Graaff	n. a.	e	3
³ Minnesota, University, Minneapolis, Minn.	Van de Graaff	20-ft accelerating tube	p, d	3.5
² Monsanto Chemical Company, Dayton, O.	Van de Graaff	n. a.	e	2
^{1, 2} National Bureau of Standards, Washington, D. C.	A-C Rectifier	2.25-ft each section	e	1.4
	Cockcroft-Walton	5-ft accelerating tube	p, d	0.25
	Van de Graaff	n. a.	p, d, α	2
¹ National Institutes of Health, Public Health Service, Bethesda, Md.	Van de Graaff	n. a.	e	2
	Van de Graaff	n. a.	e	2
	Van de Graaff	n. a.	e	3
¹ Nebraska, University, Lincoln, Neb.	Cockcroft-Walton	n. a.	positive ions	0.4
¹ Northwestern University, Evanston, Ill.	Van de Graaff	12-ft accelerating tube	p, α, e	5
¹ Notre Dame, University, Notre Dame, Ind.	Van de Graaff	12-ft accelerating tube	p, d, α, e	4

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Oak Ridge National Laboratory, Union Carbide Nuclear Company, Oak Ridge, Tenn.	Cascade	8.5-ft accelerating tube	p, d, α	0.6
	Cockcroft-Walton	3-ft accelerating tube	d	0.25
	Van de Graaff	12-ft accelerating tube	p, d, α	6.3
	Van de Graaff	4.7-ft accelerating tube	p, d	3
	Van de Graaff	2.7-ft accelerating tube	x-rays	2.0
¹ Pennsylvania, University, Philadelphia, Pa.	Van de Graaff	12-ft accelerating tube	p, d	3
² Pondville State Hospital, Wrentham, Mass.	Van de Graaff	n. a.	x-rays	2
¹ Princeton University, Princeton, N. J.	Van de Graaff	n. a.	p, d, α	3
¹ Radio Corporation of America, Princeton, N. J.	Van de Graaff	n. a.	e	1
¹ Redstone Arsenal, Huntsville, Ala.	Van de Graaff	22-ft tank length	p, d	2
^{1, 2} Rensselaer Polytechnic Institute, Troy, N. Y.	Cockcroft-Walton	3.5-ft accelerating tube	p, d	0.25
	Van de Graaff	n. a.	p, d	1
¹ Rice Institute, Houston, Tex.	Cockcroft-Walton	2-ft accelerating tube	p, d	0.2
	Van de Graaff	18-ft accelerating tube	p, d, t, He ³ , α	6
¹ Sandia Corporation, Albuquerque, N. Mex.	Van de Graaff	n. a.	p, d, e	2
¹ Shell Development Company, Houston, Tex.	Van de Graaff	n. a.	p, d	2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ Shell Development Company, Emeryville, Calif.	Van de Graaff	7-ft accelerating tube	e	3
² Socony-Vacuum Oil Company, Paulsboro, N. J.	Van de Graaff	n. a.	e	2
¹ Swedish Hospital, Seattle, Wash.	Van de Graaff	4-ft accelerating tube	x-rays, e	2
¹ Stanford Research Institute, Palo Alto, Calif.	Van de Graaff Resonant Transformer	n. a. n. a.	p, d e	2 1
² Texas Oil Company, New York, N. Y.	Van de Graaff	n. a.	p, d, a	3
² Texas Nuclear, Austin, Tex.	Van de Graaff	n. a.	p, d, a	2
¹ Texas, University, Austin, Tex.	Van de Graaff	10-ft accelerating tube	p, d, t, a	4
	Full-wave, four- tube rectifier	1.6-ft accelerating tube	d	0.1
¹ University Hospitals, Cleveland, O.	Van de Graaff	6.5-ft tank length	x-rays	2
¹ Upjohn Company, Kalamazoo, Mich.	Van de Graaff	n. a.	e	2
¹ U. S. Air Force, Air Material Command, Wright-Patterson Air Force Base, O.	Van de Graaff	n. a.	p	2
¹ U. S. Army Chemical Center, Chemical and Radiological Laboratory, Army Chemical Center, Md.	Van de Graaff	n. a.	e	0.3
^{1,2} U. S. Army Quartermaster Corps, Natick, Mass.	Van de Graaff	n. a.	p, d, a	1
¹ U. S. Naval Hospital, Bethesda, Md.	Van de Graaff	14-ft tank length	e	2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
¹ U. S. Naval Postgraduate School, Monterey, Calif.	Van de Graaff	n. a.	p, d, α, e	2
¹ U. S. Naval Radiological Defense Laboratory, San Francisco, Calif.	Van de Graaff	n. a.	p, d, α, e	2
¹ U. S. Naval Research Laboratory, Washington, D. C.	Cockcroft-Walton	4.5-ft accelerating tube	p, d	0.50
	Cockcroft-Walton	3.3-ft accelerating tube	p, d	0.25
	Van de Graaff	2.5-ft accelerating tube	p, d, He ³ , α	2.1
	Van de Graaff	3-ft accelerating tube	e, p	2.0
	Van de Graaff	4-ft accelerating tube	e	2.0
	Van de Graaff	15.5-ft accelerating tube	p, d, He ³ , α	6.0
² Virginia, University, Charlottesville, Va.	Van de Graaff	3-ft accelerating tube	p, d, α	1.5
¹ Watertown Arsenal, Watertown, Mass.	Van de Graaff	n. a.	p, d	2
¹ Wells Surveys, Inc., Tulsa, Okla.	Van de Graaff	n. a.	p, d	0.65
¹ Westinghouse Electric Corporation, Commercial Atomic Power, Pittsburgh, Pa.	Van de Graaff	6-ft tank length	p, d, e	2
	Van de Graaff	6-ft tank length	p, d, e	2
	Van de Graaff	37-ft tank length	p, d, e	2
	Van de Graaff	22.5-ft tank length	p, d, e	6
^{1, 2} Wisconsin, University, Madison, Wis.	Van de Graaff	n. a.	p, d, α	4.5
	Van de Graaff	n. a.	p, d, α	2
	Van de Graaff (tandem)	n. a.	p, α	10

Outside the United States

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Australia</u>				
1 Australian National University, Canberra	Cockcroft-Walton	9-ft accelerating tube	p, d	0.5
	Cockcroft-Walton	14-ft accelerating tube	p, d, α	1.25
1 Melbourne, University, Victoria	Van de Graaff	10-ft accelerating tube	p, d	1.0
	Van de Graaff	6.5-ft accelerating tube	e	0.7
<u>Belgium</u>				
1 Centre de Physique Nucleaire, Ecole Royale Militaire, Bruxelles	Cockcroft-Walton	n. a.	p	1.4
1 Centre de Physique Nucleaire, Louvain	Van de Graaff	3.5-m accelerating tube	p, d	1.8
1 Institut Interuniversitaire des Sciences Nucleaire, Faculte Polytechnique, Mons	Cockcroft-Walton	6-m accelerating tube	p, d, α	1.3
1 Laboratoire de Radioactivite et de Physique Nucleaire, Universite de Liège, Liège	Cockcroft-Walton	n. a.	p, d	1
	Van de Graaff	n. a.	p, d	2
	Electrostatic -charge transport by air-blown dust particles.		p, d	0.8
1 Universite Libre de Bruxelles, Bruxelles	Cockcroft-Walton	n. a.	p, d	0.85
<u>Canada</u>				
1 Atomic Energy of Canada, Ltd., Chalk River, Ontario	*Van de Graaff (tandem)	Two accelerators end-to-end	p, d, t, α	10
1 British Columbia, University, Vancouver, B. C.	Van de Graaff	16-ft accelerating tube	p, d, α	2.25

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Canada</u>				
² Canadian Defense Research Board, Alberta	Van de Graaff	n. a.	p, d, a	2
² Canadian Department of Defense Production, Montreal	Van de Graaff	n. a.	e	3
¹ Montreal, University, Montreal	Cockcroft-Walton	4.5-ft tank length	p, d	0.5
³ National Research Council, Ottawa	Van de Graaff	1.4-ft accelerating tube	e	0.6
	Van de Graaff	9-ft accelerating tube	p	4
¹ Ontario Cancer Institute, Toronto	Van de Graaff	n. a.	p, d, a	3
<u>Denmark</u>				
¹ Copenhagen, University, Copenhagen	Transformer- Rectifier	2.6-m accelerating tube	p, d	1
	Van de Graaff	4.4-m accelerating tube	p, d, a	4
	Van de Graaff	3.0-m accelerating tube	p, d, a	2.2
<u>Formosa</u>				
² National Tsing Hua University	Van de Graaff	n. a.	p, d, e	3
<u>France</u>				
¹ Centre d'Études Nucleaires, Grenoble, Isère	Van de Graaff	n. a.	p, e	0.6
	Van de Graaff	n. a.	e	0.6
	*Van de Graaff	n. a.	p, d, a, e	1.4

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>France</u>				
¹ Centre d'Etudes Nucleaires de Saclay, Saclay	Van de Graaff	3.0-m accelerating tube	p, d	2
	Van de Graaff	7.0-m accelerating tube	p, d, α	5
^{2,3} Ecole Normal Supérieure, Paris	Cockcroft-Walton	2.1-m accelerating tube	d	0.6
	Van de Graaff	2.1-m accelerating tube	p, d, e	2
² Ecole Polytechnique, Paris	Van de Graaff	n. a.	p, d	2
³ Institute Interuniversitaire des Sciences Nucleaire, Mons	Cockcroft-Walton	5-m accelerating tube	p, d	1.4
¹ Institute of Nuclear Research, University of Strasbourg, Strasbourg	Cockcroft-Walton	5-m accelerating tube	p, d, α	1.5
	*Van de Graaff	n. a.	p, d, α	6
¹ Laboratoire de Physique Atomique et Moleculaire, College de France, Paris	Van de Graaff	1.6-m accelerating tube	d \rightarrow n	0.6
	Van de Graaff	1.25-m accelerating tube	d \rightarrow n	0.15
³ Laboratoire de Synthese Atomique, Ivry	Cockcroft-Walton	n. a.	d	0.9
² Lyons, University, Lyons	Van de Graaff	n. a.	p, d, α , e	2
<u>Germany</u>				
¹ Institut für Kernphysik der Universität Frankfurt am Main	Cockcroft-Walton	n. a.	p, d	1.5

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Germany</u>				
¹ Institut für Physik im Max-Planck-Institut für Med. Forschung, Heidelberg	Van de Graaff	3-m accelerating tube	p, d, α, e	1
² Institut für Strahlen und Kernphysik, University of Bonn, Bonn	Van de Graaff	n. a.	e	3
^{1, 2} Max-Planck-Institut für Chemie, Mainz	*Van de Graaff	3.5-m accelerating tube	p, d, α, e	5
	Cockcroft-Walton	4.25-m accelerating tube	p, d	1.5
³ Max-Planck-Institute for Physics of the Stratosphere, Hechingen	Van de Graaff	5.5-m accelerating tube	p, d, α, e	1.5
¹ Physikalisches Institut der Universität Freiberg, Freiberg	Van de Graaff	n. a.	p, d	6
¹ Physical Institute, Free University Berlin-Dahlen	Van de Graaff	2-m accelerating tube	e	1
<u>Great Britain</u>				
¹ Associated Electrical Industries, Ltd., Aldermaston, England	Van de Graaff	9-ft accelerating tube	p, d	3.8
	Van de Graaff	4.5-ft accelerating tube	p, d	0.6
¹ Atomic Energy Research Establishment, Harwell, England	Cockcroft-Walton	n. a.	p, d, t	0.5
	*Van de Graaff (tandem)	14-ft accelerating tube	p, d, ¹⁶ O	10
	Van de Graaff	13-ft accelerating tube	p, d, He ³ , α	4.5
	Van de Graaff	4-ft accelerating tube	e	2.25

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Great Britain</u>				
2 British Insulated Callender's Cables, Ltd., London, England	Van de Graaff	n. a.	e	2
1, 3 Cambridge, University, Cambridge, England	Cockcroft-Walton	12-ft accelerating tube	p, d	1
	Cockcroft-Walton	16-ft accelerating tube	p, a	1.4
1, 3 Clarendon Laboratory, Oxford University, Oxford, England	Cockcroft-Walton	12-ft accelerating tube	p, d, a	1.1
	Cockcroft-Walton	6-ft accelerating tube	p, d, a	0.5
1, 3 Edinburgh, University, Edinburgh, Scotland	Cockcroft-Walton	12-ft accelerating tube	p, d, a	1.0
1 Hammersmith Hospital, London, England	Van de Graaff	7.5-ft accelerating tube	d, e	2.0
1 Liverpool, University, Mt. Pleasant, Liverpool, England	Cockcroft-Walton	n. a.	p, d	1
3 London, University, London, England	Van de Graaff	n. a.	e	2
1 Medical Research Council Radiobiological Research Unit, Harwell, England	Cockcroft-Walton	2-m accelerating tube	p, d	1
2 National Physical Laboratory, Teddington, England	Van de Graaff	n. a.	x-rays	2
1 Physical Laboratories, The University, Manchester, England	Van de Graaff	12.7-ft accelerating tube	p, d, t, He ³ , a, He ⁴ , ++	6
1 Royal Cancer Hospital, London, England	Van de Graaff	6-ft accelerating tube	p, d, a	3
	Van de Graaff	4.5-ft accelerating tube	e	2

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 (VSM) beirreleJ Location enolanenmD
 aqV Type
 Accelerator Particles Energy
 Length Accelerated (MeV)

Great Britain

- 1 Hammer-smith Hospital, London, England n.a. 3 m e 18 MeV
- 1 Liverpool Radium Institute, Clatterbridge Hospital, Liverpool, England n.a. 1.5 m e 4 MeV
- 1 Metropolitan-Vickers, Manchester, England n.a. 1 m e 4 MeV
 - 1.1 d, g edut gnidreleJDS n-SI nolW-Traveling-wave 1 m e 4 MeV
- 1 Ministry of Supply, London, England n.a. 1 m e 5 MeV
- 1 Mount Vernon Hospital, Northwood, London, England n.a. 100 cm e 3 MeV
- 1 Mullard Research Laboratories, Surrey, England n.a. 1 m e 4 MeV
- 1 Newcastle General Hospital, Newcastle-upon-Tyne, England Standing-wave 1 m e 4.3 MeV
- 1 St. Bartholomew's Hospital, London, England n.a. 6 m e 17 MeV
- 1 Western General Hospital, Edinburgh, Scotland n.a. 1 m e 4 MeV
- 1 Japan n.a. 2 m e 6 MeV
- 1 Central Research Laboratory, Hitachi Ltd., Tokyo n.a. 2 m e 6 MeV
- 1 Switzerland n.a. 2 m e 6 MeV
- 1 European Council for Nuclear Research, Geneva n.a. 2 m e 6 MeV
- 1 Union of Soviet Socialist Republics n.a. 2 m e 6 MeV
 - 6 Big Volga Laboratories, Bolshaya Volga n.a. 2 m e 6 MeV
 - 6 Moscow Physical Institute, Moscow n.a. 2 m e 6 MeV
 - 6 Ukrainian Technical Institute, Kharkov n.a. 2 m e 6 MeV

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Italy</u>				
² Bologna, University, Bologna	Van de Graaff	n. a.	x-rays	2.0
¹ Instituto di Fisica Universita Catania, Catania	Van de Graaff	n. a.	p, d	2.0
³ CISE Laboratory, Milan	Cockcroft-Walton	1-m accelerating tube	d	0.4
¹ Instituto Superior di Sanita, Rome	Cockcroft-Walton	3-m accelerating tube	p, d	1.0
² Pirelli, Milan	Van de Graaff	n. a.	e	2.0
<u>Japan</u>				
¹ Central Research Laboratory, Hitachi, Ltd., Tokyo	Cockcroft-Walton	n. a.	n. a.	0.3
	Van de Graaff	n. a.	n. a.	1.5
¹ Electrotechnical Laboratory, Tokyo	Cockcroft-Walton	n. a.	n. a.	0.8
	Van de Graaff	n. a.	n. a.	3.0
^{1, 2} Japan Atomic Energy Research Inst., (Ibaraki Pref.)	Van de Graaff	n. a.	p, d, a, e	2.0
² Japanese Chemical and Fiber Association, Osaka	Van de Graaff	n. a.	e	2.0
¹ Konan University, Kobe	Cockcroft-Walton	n. a.	p, d, t, a	0.4
¹ Kyoto University, Kyoto	Cockcroft-Walton	n. a.	p, d	0.6
¹ Kyushu University, Fukuoka	Van de Graaff	9-m tank length	p, d	5.0
¹ Osaka University, Osaka	Cockcroft-Walton	n. a.	p, d	0.6
	Van de Graaff	n. a.	n. a.	2.5

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Japan</u>				
¹ Rikkyo University, Tokyo	Cockcroft-Walton	n. a.	n. a.	0.2
¹ Scientific Research Institute, Tokyo	Van de Graaff	n. a.	n. a.	2.0
¹ Tohoku University, Sendai	Van de Graaff	7-m tank length	p, d	2.0
¹ Tokyo Institute of Technology, Tokyo	*Cockcroft-Walton	n. a.	d	0.44
¹ Tokyo Shibaura Electric Company, Ltd., Tokyo	Cockcroft-Walton	n. a.	n. a.	0.15
¹ Tokyo, University, Tokyo	Van de Graaff	n. a.	n. a.	1.6
<u>Mexico</u>				
^{2, 3} National University of Mexico, Mexico 20, D. F.	Van de Graaff	4.2-ft accelerating tube	p, d, e	2.0
<u>Netherlands</u>				
¹ Delft Institute of Technology, Delft	Van de Graaff	n. a.	p, d	2.5
¹ Natuurkundig Laboratorium der Rijksuniversiteit, Gröningen	Cockcroft-Walton	3-m accelerating tube	d	0.6
	Cockcroft-Walton	1.6-m accelerating tube	p, d	0.6
¹ State University of Utrecht, Utrecht	Cockcroft-Walton	8-ft accelerating tube	p, d	0.7
	Van de Graaff	n. a.	p, d, a	3.0
<u>Norway</u>				
¹ Fysisk Institutt, Bergen University, Bergen	Van de Graaff	7-m accelerating tube	p, d, a	1.2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Norway</u>				
1, 3 Municipal Hospital, Bergen	Van de Graaff	n. a.	e	1.5
	Van de Graaff	n. a.	p	1.5
1, 3 Norges Tehniske Hogskole, Trondheim	Van de Graaff	3.6-m accelerating tube	p, d	4.0
¹ Oslo, University, Blindern	Van de Graaff	3.6-m accelerating tube	p	2.0
	Van de Graaff	1.5-m accelerating tube	p	0.5
<u>Poland</u>				
¹ Danzig, University, Danzig	Van de Graaff	1.1-m accelerating tube	p, d	0.5
<u>Portugal</u>				
² Junta de Energia Nuclear, Lisbon	Van de Graaff	n. a.	p, d, e	2.0
<u>Spain</u>				
1, 2 Junta de Energia Nuclear, Madrid	Cockcroft-Walton	n. a.	p, d	0.6
	Van de Graaff	n. a.	p, d, t, a, e	2.0
<u>Sweden</u>				
² A. B. Atomenergi, Stockholm	Van de Graaff	n. a.	p, d, a	3.0
¹ Chalmer's University of Technology, Goteborg	Van de Graaff	4-m accelerating tube	p, d, t, a	4.0
³ Forsvarets Forskningsanstalt, Stockholm	Van de Graaff	2.25-m accelerating tube	p, d, e	5.0
³ Fysiska Institutionen, Lund	Van de Graaff	4.0-m accelerating tube	p, d	4.0
¹ Nobel Institute for Physics, Stockholm	Cockcroft-Walton	7-m accelerating tube	p, d, a	1.2

Location	Type	Dimensions	Particles Accelerated	Energy (Mev)
<u>Sweden</u>				
¹ Radiophysics Institute, Carolina Hospital, Stockholm	Cockcroft-Walton	3.5-m tank length	e→x-rays	1.2
¹ Uppsala, University, Uppsala	Van de Graaff	1.5-m accelerating tube	e	0.8
<u>Switzerland</u>				
¹ Physikalisches Institut der Eidg. Technischen Hochschule, Zurich	Cockcroft-Walton	n. a.	p, d, α	1.2
	Cockcroft-Walton	n. a.	p	2.0
¹ Physikalisches Institut der Universität Basel, Basel	Cockcroft-Walton	3-m accelerating tube	p, d	1.0
	Cockcroft-Walton	4-m accelerating tube	p, d, α	4.0
¹ Physikalisches Institut der Universität Zürich, Zürich	Van de Graaff	1.2-m accelerating tube	p, d, α	1.7
<u>Union of South Africa</u>				
¹ Diamond Research Laboratory, Johannesburg	Cockcroft-Walton	n. a.	p, d, α, e	2.0
<u>Union of Soviet Socialist Republics</u>				
³ Physico-Technical Institute, USSR Academy of Sciences, Kharkov	Van de Graaff	n. a.	e	1.0
	Van de Graaff	n. a.	p, d, e	3.0
	Van de Graaff	n. a.	p, d, e, α	5.0
<u>Yugoslavia</u>				
¹ Institute "J. Stefan," Ljubljana	Van de Graaff	1.6-m accelerating tube	p	2.0
¹ Institute of Nuclear Sciences, Belgrade	Cockcroft-Walton	5-m accelerating tube	p, d	1.5
	Cockcroft-Walton	1-m accelerating tube	p, d	0.2
¹ Institute "Rudjer Boskovic," Zagreb	Cockcroft-Walton	n. a.	d	0.2

II. Induction Machines: Betatrons

In the United States

Location	Orbit Radius	Particles Accelerated	Energy (Mev)
1, 4 Allis-Chalmers, Milwaukee, Wis.	8.20 in.	e	28
1, 4 Anderson Hospital and Tumor Institute, University of Texas Houston, Tex.	9.5 in.	e	24
1, 4 Baldwin-Lima-Hamilton Corporation, Lima, O.	8.22 in.	e→x-rays	24
4 Birdsboro Steel Foundry, Birdsboro, Pa.	7.5 in.	e→x-rays	24
4 Bonney-Floyd Steel Castings Company, Columbus, O.	7.5 in.	e→x-rays	24
1 Case Institute of Technology, Cleveland, O.	17.25 cm	e	30
3 Chicago, University, Chicago, Ill.	33 in.	e	100
4 Continental Foundry and Machine Company, Coraopolis, Pa.	8.13 in.	e→x-rays	24
4 Continental Foundry and Machine Company, East Chicago, Ind.	7.5 in.	e→x-rays	24
1 Detroit Arsenal, Ordnance Corps, Center Line, Mich.	5.5 in.	e	15
1, 3, 4 Electric Steel Foundry Company, Portland, Oreg.	8 in.	e→x-rays	22
	11.5 in.	e	50
	33 in.	e	100
1 General Electric Research Laboratory, Schenectady, N. Y.	5.25 in.	e	11.7
4 General Steel Castings Company, Eddystone, Pa.	7.5 in.	e	24
4 General Steel Castings Company, Granite City, Ill.	7.5 in.	e	24

Location

Location	Orbit Radius	Particles Accelerated	Energy (Mev)
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1, ⁴Illinois, University, Urbana, Ill.

8 in. e 24

10 in.

e 80

46 in.

e 340

1, ⁴Illinois, University, Medical School, Chicago, Ill.

20 in. e 24

¹Knolls Atomic Power Laboratory, General Electric Company, Schenectady, N. Y.

33 in. e 100

1, ⁴Los Alamos Scientific Laboratory, Los Alamos, N. Mex.

19.3 cm e 24

1, ⁴Madison Radiation Center, Madison, Wis.

8.5 in. e 24

1, ⁴Memorial Center, New York, N. Y.

20 cm e 24

⁴Mesta Machine Company, Homestead, Pa.

7.5 in. e→x-rays 24

⁴Michigan, University, Ann Arbor, Mich.

7.5 in. e→x-rays 24

⁴Mt. Sinai Hospital, New York, N. Y.

7.5 in. e→x-rays 24

³National Bureau of Standards, Washington, D. C.

115 in. e 50

⁴Ohio Steel Castings Company, Lima, O.

7.5 in. e 24

1, ⁴Pennsylvania, University, Philadelphia, Pa.

19.1 cm e 24

1, ⁴Picatinny Arsenal, Dover, N. J.

8 in. e 24

1, ⁴Pittsburgh Steel Foundry Corporation, Glassport, Pa.

8.22 in. e 24

1, ⁴Presbyterian Hospital, New York, N. Y.

7.5 in. e→x-rays 25

¹Rensselaer Polytechnic Institute, Troy, N. Y.

11.5 in. e 31

³U. S. Naval Ordnance Laboratory, Silver Spring, Md.

5.2 in. e 10

Location	Orbit Radius	Particles Accelerated	Energy (Mev)
1, 4 U. S. Naval Research Laboratory, Washington, D. C.	7.3 in.	e	21
1, 4 U. S. Navy Electronics Laboratory, San Diego, Calif.	8.2 in.	e	26
1, 4 Washington University, School of Medicine, St. Louis, Mo.	19 cm	e	24
4 Watervliet Arsenal, Watervliet, N. Y.	7.5 in.	e	24
Outside the United States			
<u>Brazil</u>			
4 Sao Paulo, University, Sao Paulo	7.5 in.	e	24
<u>Canada</u>			
1, 4 Ontario Cancer Institute, Toronto	7.5 in.	e, γ	25
1, 4 Saskatchewan, University, Saskatoon, Saskatchewan	20 cm	e	25
<u>France</u>			
1 Institute Gustave Roussy, Paris	19 cm	e	22
4 Ministry of Health, Paris	19 cm	e→γ	24
<u>Germany</u>			
1 Physikalisches Institut der Technischen Hochschule, Karlsruhe	24 cm	e	31
1 Siemens-Reiniger-Werke, Erlangen	10 cm	e	15
	21 cm	e	35
1 Universitat Frankfurt, Frankfurt	21 cm		35

Location	Orbit Radius	Particles Accelerated	Energy (Mev)
<u>Germany</u>			
Universitat Heidelberg, Heidelberg	19.2 cm	e	35
Universitat Würzburg, Würzburg	20 cm	e	35
<u>Great Britain</u>			
¹ Christie Hospital and Holt Radium Institute, Withington, Manchester, England	19 cm	e	20
¹ Metropolitan-Vickers, Manchester, England	20 cm	e	20
<u>Italy</u>			
¹ Clinica Medica, Universita Torino, Turin	26 cm	e	31
¹ Instituto Nazionale di Fisica Nucleare, Universita Torino, Turin	24.5 cm	e	31
<u>Japan</u>			
¹ Central Research Laboratory, Hitachi Ltd., Tokyo	7 cm	e	3.5
	22 cm	e	20
¹ Electrotechnical Laboratory, Tokyo	13.5 cm	e	10
¹ Osaka University, Osaka	8 cm	e	6
	19 cm.	e	24
¹ Research Laboratory, Mitsubishi Electric Company, Amagasaki	18 cm	e	30
¹ Shimadzu Seisakusho, Ltd., Kyoto	8 cm	e	6
	12.5 cm	e	15
¹ Tokyo Shibaura Electric Company, Ltd., Mazda Research Laboratory, Kawasaki	10 cm	e	15

Location	Orbit Radius	Particles Accelerated	Energy (Mev)
<u>Japan</u>			
¹ Tokyo University of Education, Tokyo	8.5 cm	e	6
	29 cm	e	30
<u>New Zealand</u>			
^{1,4} Dunedin Hospital, Dunedin, New Zealand	19 cm	e	24
<u>Norway</u>			
¹ Bergen University, Bergen	40 cm	e	47
<u>Sweden</u>			
¹ Royal Institute of Technology, Stockholm	8 cm	e	5
³ Institutionen for Fysikalisk Kemi, Stockholm	9.5 cm	e	5
<u>Switzerland</u>			
¹ Roentgeninstitut, Inselspital, Bern	25 cm	e	31
¹ Physikalisches Institut der Universitat Zurich, Zurich	30 cm	e	31
<u>Union of Soviet Socialist Republics</u>			
⁶ Lebedev Institute, Moscow	n.a.	e	30
⁶ Moscow State University, Moscow	n.a.	e	n.a.
⁶ Tomsk	n.a.	e	100
⁶ Tomsk	n.a.	e	20
<u>Yugoslavia</u>			
¹ Institute "J. Stefan," Ljubljana	25 cm	e	31

III. Resonance Machines

Linear Accelerators

In the United States

Location	Type	Accelerator Length	Particles Accelerated	Energy (Mev)
¹ Argonne Cancer Research Hospital, University of Chicago, Chicago, Ill.	Traveling-wave	16 ft	e	60
¹ Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa.	n. a.	3 ft	e	1.4
¹ Brookhaven National Laboratory, Upton, Long Island, N. Y.	n. a.	110 ft	p	50
¹ Brown University, Providence, R. I.	n. a.	3 ft	p, d	0.2
¹ California, University, Radiation Laboratory, Berkeley, Calif.	Traveling-wave	3.3 ft	e	5
	Traveling-wave	3.3 ft	e	5
	Standing-wave	40 ft	p	32
	Standing-wave	18.2 ft	p	9.8
	Standing-wave	120 ft	heavy ions to Ne ²⁰	10 Mev/nucleon
^{1, 5} California, University, Radiation Laboratory, Livermore, Calif.	*Traveling-wave	14 ft	e	16
	Traveling-wave	11 ft	p	3.75
	Traveling-wave	11 ft	d	7.5
	Traveling-wave	11 ft	α	15
¹ California, University, Radiation Laboratory, Site 300, Livermore, Calif.	Traveling-wave	6.7 ft	e	10
⁴ Columbia University, New York, N. Y.	n. a.	9.5 ft	e	15

Location	Type	Accelerator Length	Particles Accelerated	Energy (Mev)
¹ Ethicon, Inc., Somerville, N. J.	Traveling-wave	10 ft	e	7
¹ General Atomic, Division of General Dynamics, San Diego, Calif.	* n.a.	12 ft	e	33
¹ Massachusetts Institute of Technology, Laboratory for Nuclear Science, Cambridge, Mass.	n.a.	21 ft	e	17
¹ Michael Reese Hospital, Chicago, Ill.	n.a.	10 ft	e	35
¹ Minnesota, University, Institute of Technology, Minneapolis, Minn.	n.a.	120 ft	p	68
¹ Montana State University, Missoula, Mont.	Traveling-wave	37.8 ft	e	7
¹ Purdue University, Lafayette, Ind.	n.a.	10 ft	e	5.5
¹ Stanford Hospital, San Francisco, Calif.	n.a.	2.5 ft	e	1.7
¹ Stanford University, Stanford, Calif.	Traveling-wave	6 ft	e→x-rays	5
¹ Stanford University, Stanford, Calif.	Traveling-wave	12 ft	e	38
¹ Stanford University, Stanford, Calif.	Traveling-wave	260 ft	e	700
¹ Stanford University, Stanford, Calif.	Traveling-wave	20 ft	e	75
¹ Stanford University, Microwave Laboratory, Stanford, Calif.	Traveling-wave	2 ft	e	6
¹ U. S. Army Ionizing Radiation Center, Lathrop, Calif.	*Traveling-wave	15 ft	e	24
¹ Virginia, University, Charlottesville, Va.	n.a.	1 ft	e	0.75
¹ Yale University, New Haven, Conn.	n.a.	20 ft	e	7
	n.a.	138 ft	heavy ions to A ⁴⁰	10 Mev/nucleon

Outside the United States

Location	Type	Accelerator Length	Particles Accelerated	Energy (Mev)
<u>Belgium</u>				
¹ Ecole Royale Militaire, Centre de Physique Nucleaire, Brussels	Helix	5 m	p	10
¹ Ghent, University, Ghent	n. a.	2 m	e	4
	* n. a.	n. a.	n. a.	15
<u>Canada</u>				
¹ McGill University, Montreal	* n. a.	10 ft	e	10
<u>France</u>				
¹ Centre d'Etudes Nucleaires de Saclay, Saclay	n. a.	6.30 m	e	28
¹ Centre Anticancereaux, Nancy	n. a.	2 m	e	4
¹ Curie Foundation, Paris	n. a.	3 m	e	4
¹ Paris, Universite, Laboratoire d' Electronique et de Radioelectricite, Paris	Traveling-wave	1 m	e	2
<u>Great Britain</u>				
¹ Associated Electrical Industries, Ltd., Aldermaston, England	Helix	1 m	p	4
¹ Atomic Energy Research Establishment, Harwell, England	Traveling-wave	6 m	e	15
	* n. a.	100 ft	p	50
	Traveling-wave	6 m	e	28
¹ Christie Hospital and Holt Radium Institute, Manchester, England	n. a.	1 m	e	4

Location	Type	Accelerator Length	Particles Accelerated	Energy (Mev)
<u>Great Britain</u>				
¹ Hammersmith Hospital, London, England	n. a.	3 m	e	8
¹ Liverpool Radium Institute, Clatterbridge Hospital, Liverpool, England	n. a.	1.5 m	e	4
¹ Metropolitan-Vickers, Manchester, England	Traveling-wave	1 m	e	4
	Traveling-wave	1 m	e	4
¹ Ministry of Supply, London, England	n. a.	1 m	e	5
¹ Mount Vernon Hospital, Northwood, London, England	Traveling-wave	100 cm	e	3.9
¹ Mullard Research Laboratories, Surrey, England	n. a.	1 m	e	4
¹ Newcastle General Hospital, Newcastle-upon-Tyne, England	Standing-wave	1 m	e	4.3
¹ St. Bartholomew's Hospital, London, England	n. a.	6 m	e	17
¹ Western General Hospital, Edinburgh, Scotland	n. a.	1 m	e	4
<u>Japan</u>				
¹ Central Research Laboratory, Hitachi Ltd., Tokyo	*n. a.	2 m	e	6
<u>Switzerland</u>				
¹ European Council for Nuclear Research, Geneva	*n. a.	n. a.	p	50
<u>Union of Soviet Socialist Republics</u>				
⁶ Big Volga Laboratories, Bolshoya Volga	n. a.	n. a.	p	9
⁶ Moscow Physical Institute, Moscow	n. a.	n. a.	p	40
⁶ Ukrainian Technical Institute, Kharkov	n. a.	n. a.	p	21

Magnetic Accelerators: Cyclotrons

In the United States

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
¹ Argonne National Laboratory, Lemont, Ill.	CW	62 in.	p	10.8
			d	21.6
			a	43.2
¹ Brookhaven National Laboratory, Upton, Long Island, N. Y.	n.a.	18 in.	p	3
			d	2
	n.a.	60 in.	p	11
			d	22
			a	44
¹ California, University, Radiation Laboratory, Berkeley, Calif.	CW	72 in.	p	10
			d	20
			a	40
	FM	184 in.	p	720
			d	430
			a	880
¹ California, University, Radiation Laboratory, Livermore, Calif.	CW (variable energy)	90 in.	p	14
			d	12
			a	24
¹ Carnegie Institute of Technology, Pittsburgh, Pa.	FM	70.8 in.	p	450
¹ Carnegie Institution of Washington, Washington, D. C.	CW	60 in.	p	8
			d	16
			a	32

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
¹ Chicago, University, Enrico Fermi Institute for Nuclear Studies, Chicago, Ill.	FM	170 in.	p	450
¹ Columbia University, Pupin Cyclotron Laboratory, New York, N. Y.	CW	36 in.	p d	15 10
¹ Columbia University, Nevis Cyclotron Laboratories, Irvington-on-Hudson, N. Y.	FM	164 in.	p	400
¹ Harvard University, Cyclotron Laboratory, Cambridge, Mass.	FM	95 in.	p	160
¹ Illinois, University, Urbana, Ill.	n. a.	47 in.	p d α	6 12 24
¹ Indiana University, Bloomington, Ind.	CW	45 in.	d He ⁺⁺	11.4 27.8
¹ Lewis Flight Propulsion Laboratory, National Advisory Committee for Aeronautics, Cleveland, O.	CW	60 in.	d	20
¹ Los Alamos Scientific Laboratory, Los Alamos, N. Mex.	CW (variable energy)	42 in.	p d α	9 16 32
¹ Massachusetts Institute of Technology, Laboratory for Nuclear Science, Cambridge, Mass.	n. a.	42 in.	p d α	7.5 15 30
¹ Michigan, University, Ann Arbor, Mich.	CW	42 in.	p, d, α	10
¹ Oak Ridge National Laboratory, Oak Ridge, Tenn. (continued on page 143)	CW	86 in.	p	25

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
¹ Oak Ridge National Laboratory, Oak Ridge, Tenn.	CW	63 in.	N ³⁺	27
	CW	44 in.	p	5
	CW	48 in.	N ⁵⁺	80
¹ Oregon State College, Corvallis, Oreg.	CW	37 in.	d	7.5
¹ Pittsburgh, University, Radiation Laboratory, Pittsburgh, Pa.	n.a.	47 in.	p	9.5
			d	19
			a	38
¹ Princeton University, Palmer Physical Laboratory, Princeton, N. J.	FM	35 in.	p	20
¹ Purdue University, Lafayette, Ind.	n.a.	37 in.	d	9.7
			a	19.4
¹ Rochester, University, Rochester, N. Y.	n.a.	27 in.	p	7
			d	4.3
			a	7
	FM	130 in.	p	240
¹ Stanford University, Stanford, Calif.	CW	27 in.	d	2.8
¹ U. S. Naval Research Laboratory, Washington, D. C.	n.a.	6 in.	e	1
	n.a.	6 in.	e	3
	n.a.	6 in.	e	3
	n.a.	6 in.	e	6
¹ Washington University, St. Louis, Mo.	CW	45 in.	p	5.1
			d	10.2
			a	20.4

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (MeV)
¹ Yale University, Sloane Physics Laboratory, New Haven, Conn.	CW	28 in.	d	4.2
			α	7.6
Outside the United States				
<u>Argentina</u>				
³ n. a.	FM	n. a.	n. a.	n. a.
<u>Australia</u>				
¹ Australian National University, Canberra	n. a.	30 in.	p	8
¹ Melbourne, University, Melbourne	variable energy	40 in.	p	12.5
			d	6.25
			α	12.5
<u>Belgium</u>				
^{1, 3} Centre de Physique Nucleaire, Louvain	CW	94 cm	d	13.35
<u>Canada</u>				
¹ McGill University, Montreal, Quebec	FM	82 in.	p	100
¹ Western Ontario, University, London, Ontario	n. a.	35 cm	e	4.5
<u>Denmark</u>				
¹ Copenhagen, University, Copenhagen	CW	90 cm	p	5.5
			d	11
			α	22

also C, N, O

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
<u>France</u>				
¹ Centre d' Etudes Nucleaires de Saclay, Saclay	n. a.	160 cm	d	20
			α	45
			N^{6+}	120
			O^{6+}	120
<u>Germany</u>				
¹ Institut für Strahlen-Und Kernphysik, Universität Bonn, Bonn	FM	190 cm	d	35
			α	70
¹ Institut für Physik im Max-Planck-Institut für Med. Forschung, Heidelberg	CW	101 cm	d	13
¹ Universität Braunschweig, Braunschweig	n. a.	50 cm	e	5
¹ Universität Mainz, Mainz	n. a.	50 cm	e	10
<u>Great Britain</u>				
¹ Atomic Energy Research Establishment, Harwell, England	FM	110 in.	p	175
^{1, 3} Birmingham, University, Birmingham, England	CW	61.5 in.	p	10
			d	20
			H_2^+	
			He^3	
			α	40
			C	
			N	
			O	

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (MeV)
<u>Great Britain</u>				
^{1, 3} Cambridge, University, Cambridge, England	n.a.	35.5 in.	p	8
			d	
			a	
¹ Hammersmith Hospital, London, England	CW	50 in.	p	7.5
			d	15
			a	30
¹ Liverpool, University, Mt. Pleasant, Liverpool, England	CW	37 in.	p	4.5
			d	8.9
			p	410
¹ University College, London, England	n.a.	20 in.	e	4.5
			e	25
			e	
<u>Israel</u>				
¹ Hebrew University, Jerusalem	n.a.	n.a.	p	1
<u>Japan</u>				
¹ Kyoto University, Kyoto	n.a.	105 cm	d	16
¹ Osaka University, Osaka	n.a.	111.8 cm	d	12
¹ Scientific Research Institute, Tokyo	n.a.	66 cm	d	4
¹ Tokyo, University, Institute of Science and Technology, Tokyo	n.a.	40 cm	d	2
			p	4

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
<u>Japan</u>				
¹ Tokyo, University, Institute for Nuclear Study, Tokyo	n. a.	160 cm	p	65 (FM)
			d	22 (CW)
			p	16 (CW)
<u>Netherlands</u>				
¹ Instituut voor Kernfysisch Onderzoek, Amsterdam	FM	180 cm	d	26
			α	52
<u>Sweden</u>				
¹ Nobel Institute for Physics, Stockholm	CW	80 cm	p	3.5
			d	7
			α	14
	CW	225 cm	p	11/Mev nucleon
			d	11/Mev nucleon
			α	11/Mev nucleon
			ions to Ne^{6+}	11/Mev nucleon
¹ Uppsala, University, Gustaf Werner Institute for Nuclear Chemistry, Uppsala	FM	230 cm	p	192
<u>Switzerland</u>				
¹ Physikalisches Institut der Universitat Zurich, Zurich	FFAG	33 in.	p	7.5
			d	10
			α	20

Location	Type	Pole-piece Diameter	Particles Accelerated	Energy (Mev)
<u>Switzerland</u>				
¹ European Council for Nuclear Research, Geneva	FM	50 cm	p	600
<u>Union of South Africa</u>				
¹ South African Council for Scientific and Industrial Research, Pretoria	CW	113 cm	d	15.5
<u>Union of Soviet Socialist Republics</u>				
^{1, 6} Big Volga Laboratories, Bolshoya Volga	FM	6 m	n.a.	680
⁶ Institute for Thermal Studies, Moscow	CW	1.5 m	n.a.	n.a.
⁶ Moscow Physical Institute, Moscow	n.a.	1.5 m	n.a.	n.a.
⁶ Peking	CW	n.a.	n.a.	25
¹ Radium Institute, USSR Academy of Sciences, Leningrad	n.a.	14 in.	d	1.8
<u>Yugoslavia</u>				
¹ Institute "Rudjer Boskovic," Zagreb	* n.a.	140 cm	p	8
			d	16
			heavy ions	

Magnetic Accelerators: Synchrotrons

In the United States

Location	Type	Orbit Radius	Particles Accelerated	Energy (Mev)
¹ Brookhaven National Laboratory, Upton, Long Island, N. Y.	proton	30 ft	p	3,000
	*proton	421.45 ft	p	30,000
¹ California, University, Medical Center, San Francisco, Calif.	electron	29 cm	e	70
¹ California, University, Radiation Laboratory, Berkeley, Calif.	electron	3.3 ft	e	340
	proton	50 ft	p	6,300
¹ California Institute of Technology, Pasadena, Calif.	electron	376 cm	e	1,200
¹ Cornell University, Laboratory of Nuclear Studies, Ithaca, N. Y.	electron	12.5 ft	e	1,000
¹ General Electric Company, Schenectady, N. Y.	electron	2 ft	e	300
¹ Iowa State College, Ames, Ia.	electron	1 ft	e	90
	electron	1 ft	e	90
¹ Massachusetts Institute of Technology, Cambridge, Mass.	electron	3.3 ft	e	350
¹ Michigan, University, Ann Arbor, Mich.	electron	3.3 ft	e	100
¹ Midwestern Universities Research Association, Madison, Wis.	FFAG	60 cm	e	0.4
	FFAG	60 cm	e	0.4
	FFAG	150 cm	e	40
¹ Purdue University, Lafayette, Ind.	electron	100 cm	e	340

Location	Type	Orbit Radius	Particles Accelerated	Energy (Mev)
¹ U. S. Naval Research Laboratory, Washington, D. C.	*electron	77 cm	e	100
¹ Virginia, University, Charlottesville, Va.	electron	30 cm	e	75
<u>Outside the United States</u>				
<u>Australia</u>				
¹ Australian National University, Canberra	*proton	480 cm	p	10,600
	electron	10 cm	e	33
¹ Melbourne, University, Melbourne	electron	10 cm	e	18
<u>Canada</u>				
¹ Queens University, Kingston, Ontario	electron	29.3 cm	e	70
<u>France</u>				
¹ Centre d'Etudes Nucleaires de Saclay, Saclay	proton	8.40 m	p	4,000
<u>Germany</u>				
¹ Physikalisches Institut, Freie Universitat, Berlin - Dahlem	electron	7.5 cm	e	12
¹ Physikalisches Institut der Universitat Bonn, Bonn	electron	170 cm	e	500
<u>Great Britain</u>				
¹ Birmingham, University, Birmingham England	proton	450 cm	p	1,000
¹ Cambridge, University, Cambridge, England	electron	10 cm	e	33
¹ Oxford University, Oxford, England	electron	46.7 cm	e	125

Location	Type	Orbit Radius	Particles Accelerated	Energy (Mev)
<u>Great Britain</u>				
¹ Glasgow, University, Glasgow, Scotland	electron	125 cm	e	340
¹ Royal Cancer Hospital, London England	electron	10 cm	e	30
<u>Italy</u>				
¹ Istituto Nazionale di Fisica Nucleare, Rome	electron	360 cm	e	1,000
<u>Japan</u>				
¹ Osaka Prefectural University, Osaka	electron	14 cm	e	30
¹ Tohoku University, Sendai	electron	25 cm	e	40
	electron	30 cm	e	60
¹ Tokyo, University, Faculty of Science, Tokyo	electron	100 cm	e	200
¹ Tokyo, University, Institute of Nuclear Study, Tokyo	electron	400 cm	e	1,000
¹ Tokyo Institute of Technology, Tokyo	electron	15 cm	e	25
<u>Netherlands</u>				
¹ Delft Institute of Technology, Delft	proton	3.25 m	p	1,000
<u>Sweden</u>				
¹ Institutionen for Elektronik, Royal Institute of Technology, Stockholm	electron	3.65 m	e	1,200
<u>Switzerland</u>				
¹ European Council for Nuclear Research	proton	100 m	p	25,000
¹ Roentgeninstitut, Inselspital, Bern	electron	29 cm	e	100

Location	Type	Orbit Radius	Particles Accelerated	Energy (Mev)
<u>Union of Soviet Socialist Republics</u>				
1, 6, 7 Big Volga Laboratories, Bolshoi Volga	proton	28 m	p	10,000
6, 7 Leningrad	electron	n.a.	e	150
6, 7 Lebedev Institute, Moscow	electron	n.a.	e	240
	electron	n.a.	e	600
6 Moscow Physical Institute, Moscow	nonferrous, electron	n.a.	e	200

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