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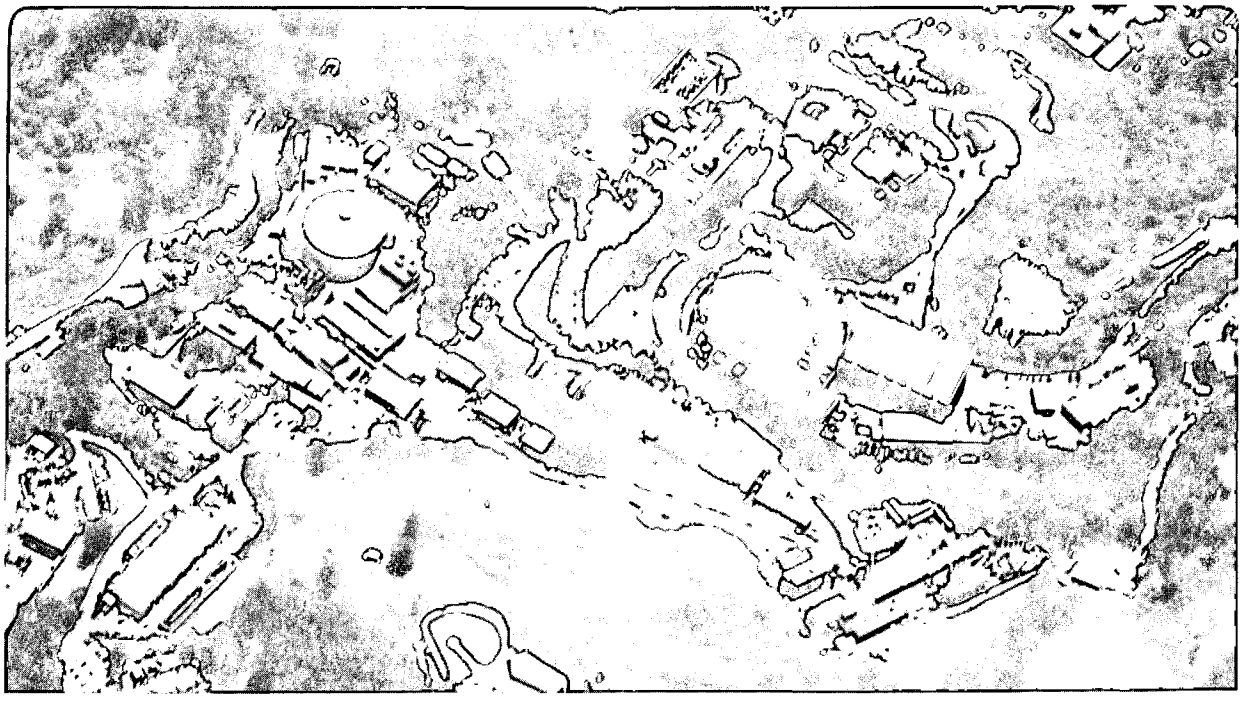

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The Software Standards and Documentation Group of the Workshop on Physics and Detector Simulation for SSC Experiments has compiled a list of physics generators, detector simulations, and related programs. This is not meant to be an exhaustive compilation, nor is any judgement made about program quality; it is a starting point for a more complete bibliography. Where possible we have included an author and source for the code. References for most programs are in the final section.

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Event Generators

Program	*Author(s)*	*Contact*	*Description*
ARIADNE	U. Pettersson and L. Lönnblad	KITTEL @CERNVM	A program for QCD cascades in the color dipole formulation.
BABAMC	F. Berends et al.	CERN	Stand-alone first order generator for $e^+e^- \rightarrow e^+e^-(\gamma)$.
BHLUMI	S. Jadach and B. F. L. Ward	CERN	Uses the YFS method to simulate multiple photon effects in $e^+e^- \rightarrow e^+e^-n(\gamma)$ at low angles, on an event by event basis.
CALASY	Z. Was	WASM @CERNVM	A semianalytical program for the calculation of basic observables of τ decay products such as σ_{tot}, A_{FB}, and $cos(\theta)$*energy distributions at LEP energies.
CALTECH-II	T.D. Gottschalk (Cal Tech)	CalTech	An e^+e^- event generator based on parton showers and a hybrid of cluster (*à la* Webber) and string (*à la* Lund) hadronization.

Program	*Author(s)*	*Contact*	*Description*
COJETS	R. Odorico (Bologna)	CERN	Simulation for $\bar{p}$-p and p-p collisions.
DPSJET	W. Ochs	WWO @DM0MPI11	A statistical model of jet evolution.
DTUJET	J. Ranft	CERN	A *p-nucleus* event generation program for minimum bias and minijets only.
DYMU2	J. Campagne R. Zitoun	CERN	Models Drell-Yan process and *parton-parton* scattering in *hadron-hadron* collisions.
EPOCS	K. Kato and T. Munehisa	KEK	An e^+e^- event generator, including production and hadronization of top quarks and quarkonium, for Tristan, LEP and SLC energies.
EPOS	G. Valenti et al.	GIANNI @VXCERN	Models e^+e^- annihilation using the fire-string model.
EURODEC	A. Ali and B. van Eijk	CERN	A Monte Carlo program package for the fragmentation of partons and decays of particles.
EXPOSTAR	D. Kennedy et al.	SLAC	A simple simulation for calculating electroweak quantities at LEP/SLC energies, including initial state radiative effects by exponentiation, but no final state radiation.
FPAIR	F. Berends et al.	CERN	An e^+e^- simulation which aims at a precise description of events with one or more bremsstrahlung photons.
HERWIG	G. Marchesini and B. Webber	CERN	A general purpose event generator: parton shower and local color singlet cluster for hadronization. **H**adron **E**mission **R**eactions **W**ith **I**nterfering **G**luons.
HOWLEEG		CERN	An $e^+e^- \rightarrow e^+e^-\gamma$ generator which includes QED and an ad-hoc exponentiation.
ISAJET	F. Paige and S. Protopopescu	BNL PAIGE@BNL	A hadron-hadron event generator which includes most hard scattering processes with the independent fragmentation model.
JETSET	T. Sjöstrand et al.	CERN	The Lund Monte Carlo for event generation. Includes e^+e^- generation and LUND string fragmentation.
KORALB	Z. Was	WASM @CERNVM	A Monte Carlo program for τ pair production at low energies.
KORALZ	Z. Was	WASM @CERNVM	A Monte Carlo program for fermion pair (μ, τ, ν, u, d, c, s, (b)) production at LEP energies.
MMGE92	J. P. Alexander et al.	CERN	An extension of MMG1/MUSTRAAL which includes second order effects for initial state radiation and exponentiation.
MOE	G. Bonvicini et al.	CERN	Simulates multiphoton production in initial state radiation for the reaction $e^+e^- \rightarrow f\bar{f}n(\gamma)$.

Program	*Author(s)*	*Contact*	*Description*
MULTJ	R. Odorico	Belfast	A program for QCD event simulation in e^+e^- annihilation at LEP energies.
MUONMC	F. Berends et al.	CERN	Sister program to BABAMC, simulates $e^+e^- \rightarrow \mu^+\mu^-(\gamma)$.
MUSTRAAL	F. Berends et al.	CERN	Simulation of radiative corrections to the processes $e^+e^- \rightarrow \mu^+\mu^-$ and $e^+e^- \rightarrow \overline{q}q$ in the Z^0 region.
NLLjet	K. Kato et al. (Japan)	KAMAE @JPNKEKVM	A QCD parton shower Monte Carlo based on the next-to-leading log approximation, uses JETSET for hadronization.
NUNUBGG	F. Berends et al.	CERN	Simulates and calculates the cross section for $e^+e^- \rightarrow \nu\overline{\nu}\gamma(\gamma)$.
OLDBAB	F. Berends and R. Kleiss	CERN	A Bhabha event generator developed for PEP and PETRA energies.
PAPAGENO	I. Hinchliffe (LBL)	THEORY@LBL	A partonic Monte Carlo program that uses exact QCD matrix elements for given processes.
PARJET	Fippel et al.	CERN	Implements the evolution of quark-antiquark jets as produced in e^+e^-.
PHOTOS	B. van Eijk and Z. Was	WASM @CERNVM	Models bremsstrahlung photons in decays.
PYTHIA	T. Sjöstrand and H.-U. Bengtsson	CERN	A general purpose hadron-hadron event generator that uses JETSET for hadronization.
RABHAT	K. Tobimatsu and Y. Shimizu	KEK	An e^+e^- event generator with a missing final e^+ and/or e^-.
SAGE	R. Chaffee	SLAC	A simple and fast parton phase space Monte Carlo.
TEEGG	D. Karlen	SLAC	Simulates radiative Bhabha scattering up to $O(\alpha^2)$ for configurations when one or both electrons scatter at small angles.
TIPTOP	S. Jadach and J. Kühn	JXK @DM0MPI11	Models heavy fermion production and decay in e^+e^- annihilation, incorporating initial state radiation, longitudinal beam polarization, and the effects of the polarizations of the produced heavy fermions.
UCLA	C. Buchanan and S. Chun	UCLA UCLA::CDBP04	An adaptation of JETSET which uses the Lund parton shower structure, but replaces the Lund fragmentation description with a small number of hadron level parameters.
VENUS	K. Werner	CERN	A heavy ion event generator.

Electromagnetic or Hadronic Interactions

AEGIS	A. Van Ginneken	FNAL	Simulates electromagnetic interactions with matter.

Program	*Author(s)*	*Contact*	*Description*
CASIM	A. Van Ginneken	FNAL	Models hadronic production in *hadron-nucleus* collisions via a modification of the Hagedorn-Ranft thermodynamic model.
COG	T. P. Wilcox and E. M. Lent	LLNL	A *neutron-photon* transport code designed to solve the Boltzman equation for deep penetration (shielding) problems.
EGS4	W. R. Nelson et al.	SLAC	Simulates electromagnetic interactions with matter.
FLUKA	A. Aarnio et al.	CERN	Simulates hadronic cascades, with an interface to EGS4 for electromagnetic interactions. The core event generator EVENTQ is also used in HETC.
GHEISHA	H. Fesefeldt	Aachen	Simulates hadronic interactions, with an interface to EGS4 for electromagnetic interactions.
HADRIN	K. Hanssgen and J. Ranft	CERN	Simulates *hadron-nucleon* interactions up to about 5 GeV.
HETC	R. G. Alsmiller, et al.	ORNL	Simulates hadronic interactions with matter.
LAHET	R. E. Prael and H. Lichtenstein	LANL	A union of the HETC code and MCNP with a common geometry and a few enhancements to HETC.
MARS	N. V. Mokhov and J. D. Cossairt	FNAL	Simulates hadronic and electromagnetic cascades and μ transport.
MCNP		LANL LEE@LAMPF	LANL's continuous energy *neutron-proton* transport code. Simulates hadronic interactions below about 20 MeV.
MORSE	M. B. Emmett	ORNL	Simulates low energy hadronic interactions.
NUCRIN	K. Hanssgen and J. Ranft	CERN	Simulates low energy *hadron-nucleus* interactions.

Simulation packages and Frameworks

ANLSIM	H.-J. Trost	ANLHEP::TROST	A GEANT framework for SSC simulation.
CALOR89	T. Gabriel et al.	ORNL	A general simulation package for hadronic interactions; encompasses HETC and lower energy codes.
GARF	R. Veenhof	CERN	A program for the detailed simulation of 2-D wire chambers consisting of thin wires and equipotential planes.
GEANT3	R. Brun et al.	CERN	A general detector simulation package.
GEANE	M. Maire, E. Nagy et al.	CERN	Calculates average trajectories of particles and calculates the transport matrix and error covariance matrix. Integrated into GEANT.

Program	*Author(s)*	*Contact*	*Description*
GFLASH	G. Grindhammer et al.	DESY (F36GGG @DHHDESY3)	A package to add parametrised showers into GEANT.
GVerify	S. Youssef	SCRI::YOUSSEF	Detects errors in GEANT geometries.
HERMES	D. Filges	KFA Jülich REW089@JUKF11	A general simulation package with emphasis on neutrons, based on a low energy version of HETC.
MC4	S. Youssef	SCRI::YOUSSEF	Has vectorised EM interactions in simple geometries.
POISSON	R. Holsinger C. Iselin	CERN	A collection of programs for calculating magnetostatic and electrostatic fields for magnet design calculations.
QFL	J. Freeman et al.	FNAL	A simple detector simulation.
SPICE		SPICE@CAD .BERKELEY.EDU	A general purpose circuit simulation program.
SSCANA	E. Wang and A. Bay	LBL (EMWP04@LBL)	An integrated simulation package.
SSCSIM	S. Linn	SCRI::LINN	A GEANT framework for SSC Simulation.

Data Managers and Data Structure Packages

ADAMO	P. Palazzi et al.	PALAZZI @VXCERN	A data system for scientific programming based on the Entity-Relationship model.
BOS	V. Blobel	DESY	A data structure manager.
CHEETAH	P. Kunz and G. Word	WORD @SLACVM	A data management package for C programs, portable between VM, VMS, and UNIX.
DUCS	A. S. Johnson et al.	TONYJ @SLACVM	Automated code and documentation distribution system for IBM and VMS.
JAZELLE	A. S. Johnson et al.	TONYJ @SLACVM	A symbolic data management system for HEP data from data acquisition to DST.
TYPES	S. Youssef	SCRI::YOUSSEF	A data abstraction package for FORTRAN.
UFMULTI	P. Avery et al.	U of Florida	A framework for HEP farm processing on VMS or UNIX.
YBOS	D. Quarrie	CDF, CEBAF	A data structure manager.
ZEBRA	R. Brun et al.	CERN	A data structure manager.

Display, Fitting, and Analysis Programs; Interactive Interfaces

BWGNEW	W. S. Lockman	UCSC BILLY@SLACVM	A package which performs log likelihood fits to Breit-Wigner and gaussian distributions using the minimization routine MINUIT.
Clustering Toolbox	S. Youssef	SCRI::YOUSSEF	This is a toolbox for exploring clustering algorithms.

Program	*Author(s)*	*Contact*	*Description*
DISPLAY	H. L. Videau, B. Gabioud et al.	KOELLNER @LBL	An interactive package for the display and manipulation of HBOOK histograms.
GBOOK	T. Sjöstrand	LUND	An HBOOK-compatible histogramming package in standard FORTRAN.
GEP	E.Bassler et al.	R02BAS @DHHDESY3	A batch and interactive package for generation, display, and manipulation of histograms, scatter plots, and n-tuples.
HANDYC	B. Mours	PFKEB @SLACVM	A general purpose histogramming and plotting package for C programs.
HANDYPAK	A. Boyarski	SLAC	A general purpose histogramming and plotting package.
HBOOK	R. Brun and D. Lienart	CERN	A histogramming and plotting package.
HIGZ	R. Bock et al.	CERN	An interactive graphics interface based on ZEBRA.
HPLOT	R. Brun and N. Cremel Somon	CERN	A FORTRAN-callable facility for producing HBOOK output on graphic devices other than a line printer.
IDA	T. H. Burnett	SLAC	An interactive data analysis package.
KUIP	R. Brun and P. Zanarini	CERN	An interactive user interface frequently used in CERN products.
MINUIT	F. James and H. Roos	CERN VXCRNA::JAMES	A tool to find the minimum value of a multi-parameter function and analyse the shape of the function around the minimum.
MUDIFI	R. Brun et al.	CERN	**Multidi**mensional **Fi**t program: allows user to approximate a linear combination of polynomials.
PAW	R. Brun et al.	CERN	An interactive package for data analysis.
PYKUIP	S. Linn	SCRI::LINN	PYKUIP is a KUIP interface to PYTHIA.
REASON	W. B. Atwood et al.	PFKEB@ SLACVM	A graphical physics analysis package for use in the NextStep computing environment.
TOPDRAWER	R. Chaffee (SLAC)	many versions CLEMENT @RICE has a nice interactive interface	Creates and manipulates good quality histograms and plots.
UGS	R. Beach	SLAC	**U**nified **G**raphics **S**ystem, a collection of FORTRAN subroutines which is designed to run on a number of computers and control almost any line drawing graphic device.

Program	*Author(s)*	*Contact*	*Description*
Programming Aides, Source Code Managers, Databases, and Other Essentials			
ASPIRIN	A. S. Johnson	SLAC	Provides partial translation from VAX FORTRAN to FORTRAN77 (see also FORSE).
CMZ	M. Brun et al.	CERN	Code management using ZEBRA, compatible with PATCHY.
COMIS	V. Berezhnoi et al.	CERN	Compilation and Interpretation System.
EXPAND	K. Chadwick	FNAL	The CDF version of VAX FORTRAN to IBM or ACP FORTRAN.
FORSE	S. Youssef	SCRI::YOUSSEF	Provides partial VAX FORTRAN to FORTRAN77 (complementary to ASPIRIN).
FORTRIX			Translates FORTRAN to C.
PATCHY	R. Brun et al.	CERN	A system for source code management. Being replaced by CMZ.
QSPIRES		SLAC	A facility for using BITNET to search the SLAC high energy physics database or a variety of other databases with information such as names, phone numbers, and computer accounting information for people associated with SLAC.
SPIRES		installed at SLAC and elsewhere	A general database for high energy physics, including preprints, papers, books, and conferences.
VMSREXX	A. S. Johnson et al.	TONYJ @SLACVM	A REXX interpreter for VAX/VMS.
Toolpack	L. J. Osterweil et al.	Numerical Algorithms Group (312)971-2337	An integrated set of tools to support FORTRAN software development.
WHO		CERN and elsewhere	WHO is an interactive utility to find userids, nodes, and addresses of high energy physicists.

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