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Authors

Cabezas, Amado Y
Lindgren, Ingvar P K
Marrus, Richard

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Ground-State Electronic Structure of Erbium and Nuclear Spins of Er^{169} ,
 Er^{171} , and Gd^{159} . * AMADO Y. CABEZAS, INGVAR P. K. LINDGREN,**

AND RICHARD MARRUS, Lawrence Radiation Laboratory and Department

of Physics, Berkeley, California. -- Atomic-beam magnetic resonance

studies of neutron-activated erbium and gadolinium have yielded three

nuclear spins. These are Er^{169} ($I=1/2$), Er^{171} ($I=5/2$) and Gd^{159} ($I=3/2$).

These measurements are in agreement with the assignments made from
beta-ray spectroscopy and with the level diagram proposed by Nilsson.¹

Measurements of the erbium spins were made by observing the Zeeman

transitions in a state characterized by $J = 6$ and $g_J = 1.164(5)$. It is inferred

that this state almost certainly arises from almost pure L-S coupling among

the electrons of the configuration $(4f)^{12} (6s)^2$ to the Hund's Rule ground state

3H_6 . Observations of gadolinium resonances were made in the five J states

arising from the ground state 9D . The observed resonances are in agree-

ment with g_J values previously measured.²

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** On leave from the Institute of Physics, University of Uppsala, Uppsala, Sweden.

¹ S. G. Nilsson, Kgl. Danske Videnskab. Selskab Mat.-fys. Medd. 29, No. 16
(1955).

² K. F. Smith and I. J. Spaulding (Cambridge University, Cambridge, England),
private communication.

A. P. S. Meeting-Montreal, Canada, June 1960.