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Nucleon Induced Reactions

Analogs of Magnetic Dipole States Observed in (p,n) Reactions on Self-Conjugate Targets. D. BAINUM, J. RAPAPORT, Ohio U.[†]; C. GOULDING, M. GREENFIELD, Florida A&M U.; C.C. FOSTER, Indiana U.[†]; B. ANDERSON, A. BALDWIN, J. KNUDSON, R. MADEY, T. WITTEN, Kent State U.*; and C.D. GOODMAN, Oak Ridge Nat. Lab.[†]--We have measured neutron spectra from (p,n) reactions on four self-conjugate targets (^{12}C , ^{24}Mg , ^{28}Si , ^{40}Ca) with 62 MeV and 135 MeV protons from the Indiana University Cyclotron. Spin-flip, isospin-flip, M1 transitions are the most prominent features for ^{12}C , ^{24}Mg and ^{28}Si targets. These M1 transitions have forward peaked angular distributions at both energies, but are more forward peaked at 135 MeV. For the ^{24}Mg target the M1 strength appears split into two major components at 1.1 MeV and 3.0 MeV in ^{24}Al . For the ^{12}C and ^{28}Si targets, the M1 strength appears concentrated in single states, the ground state of ^{12}N and the 2.1 MeV state of ^{28}P . No strong M1 transitions were observed with the ^{40}Ca target. The most prominent feature is a peak corresponding to a state at 0.88 MeV in ^{40}Sc which has an angular distribution characteristic of a higher angular momentum transfer.

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