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FAST-NEUTRONS INCIDENT ON HOLMIUM

by

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ABSTRACT

Differential neutron-scattering cross sections of elemental holmium (*i.e.*, ^{165}Ho) are measured at forty or more scattering angles, at ~ 0.5 MeV incident-energy intervals, from ~ 4.5 - 10.0 MeV. These new results are combined with neutron total and scattering cross sections previously reported in the literature to obtain as comprehensive an experimental data base as possible. This data is interpreted in the context of spherical-optical, coupled-channels and dispersive models, with particular attention to the collective excitation of the $K = 7/2$ ground-state rotational band of ^{165}Ho . The effect of the collective properties on the model potentials is discussed. Comparisons are made with previous models reported in the literature and with the relevant portions of the ENDF/B-6 evaluated nuclear data file. Generally, the latter evaluation is supported by the present work. Suggestions for future charged-particle and neutron studies of holmium are made.