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**Neutron Thermalization in Heavy Water; an Investigation
(Untersuchungen zur Neutronenthalisierung
in schwerem Wasser)**

Abhandlung
zur Erlangung der Würde eines
Doktors der Naturwissenschaften

der

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ABSTRACT

To check different scattering models for heavy water time dependent and steady state spectrum measurements have been made. The time dependent spectra were measured in the pure moderator using a pulsed source and a chopper. The steady state spectra were observed in cadmium solutions at various distances from a source of fast neutrons provided by a reactor. The neutrons were analyzed by time of flight. Calculations based on diffusion and transport theory were made using the free gas model, the Nelkin-Honeck model and the Haywood scattering kernel for D_2O . The kernels were found to predict quite different thermalization properties. Theoretical spectra based on the Haywood kernel agreed best with the experimental results.