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Dipole polarizability of Ca-48

Inelastic proton scattering at extreme forward angles is a powerful tool to investigate electric dipole and magnetic spin excitations with a high energy resolution. It is possible to separate E1 from M1 contributions to angular distributions as demonstrated in the cases of Pb-208 and Zr-90. Data from a proton-scattering experiment on Ca-48 are currently analyzed. The excitation energies range from 4 MeV to 26 MeV. Due to this broad energy range almost the complete E1 strength can be extracted. The dipole polarizability has been suggested [1] as a new measure of the neutron skin from a strong correlation of both quantities found in virtually all RPA calculations. A precise value for the polarizability has been extracted from the experiment on Pb-208 [2]. However, while the correlation is observed in all models, absolute values for the derived neutron skin dier considerably. Thus, further data are necessary to constrain the models. The case of Ca-48 was found to be of special interest [3]. Further-more, microscopic coupled cluster or no-core shell model calculations are able to relate 3N forces to the neutron skin thickness in Ca-48 [4].

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