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Evolution of the Electric Dipole Response in the Stable Sn Isotope Chain

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Inelastic proton scattering at very forward angles and energies of a few hundred MeV has been established as a new tool to study the complete E1 response in nuclei in the excitation energy region between about 5 and 25 MeV [1,2]. Such data are crucial to determine the dipole polarizability of nuclei, which in turn provides important constraints on the neutron skin thickness and the Equation Of State (EOS) of neutron-rich matter [3-5]. They also shed light on the much-discussed nature of the Pygmy Dipole Resonance (PDR) observed in nuclei with neutron excess [6-8].

The chain of Sn isotopes represents a particularly interesting case to investigate the impact of the neutron excess on the E1 response of nuclei in a systematic manner because their g.s. structure changes little. We report first results from a systematic study of the stable even-mass nuclei $^{112-124}$ Sn covering n/p ratios 1.24 - 1.48.

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