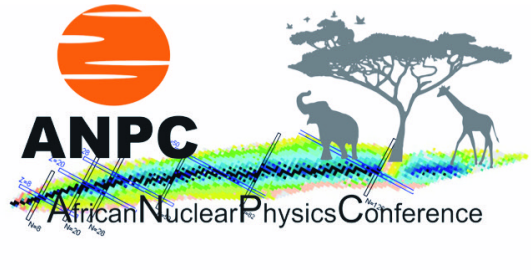


Contribution ID: **73** Type: **Invited Talk**

# Evolution of the Dipole Response in the Stable Sn Isotope Chain: Polarizability, Pygmy Dipole Resonance and Gamma Strength Function

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 on the Equation of State of neutron-rich matter [3-5]. They also shed new light on the much-discussed nature of the Pygmy Dipole Resonance (PDR) observed in nuclei with neutron excess [6,7]. Since the data also provide information on the spin-M1 strength [8,9], one can extract the full Gamma Strength Function (GSF) [10]. The high-resolution experiments furthermore allow an extraction of the level density (LD) [11], and the combined GSF and LD results permit a novel test of the Brink-Axel hypothesis for GSFs in the energy region of the PDR [11].

The chain of Sn isotopes represents a particularly interesting case to investigate the impact of neutron excess on the E1 response of nuclei in a systematic manner because their g.s. structure changes little. We report results from a systematic study of the stable even-mass nuclei 112,114,116,118,120,122,124Sn on all of the above problems.

Supported by the DFG under contract SFB 1245 and by the JSPS KAKENHI, Grant No. JP25105509.

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