Pygmy dipole resonance in stable nuclei

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The pygmy dipole resonance (PDR) is a subject of high current interest in low-energy nuclear structure. Its existence is a common prediction of microscopic models (albeit with large differences between models based on nonrelativistic and relativistic mean-field descriptions) in neutron-rich nuclei linking its appearance to the formation of a neutron skin. The present talk reviews possible evidence for such a mode in magic and semimagic stable nuclei based on high-resolution (γ, γ') experiments with an emphasis on the $Z = 50$ shell closure. Data in the chain of stable tin isotopes are of particular interest since they provide a link to studies on the exotic neutron-rich isotopes $^{129-132}$Sn at GSI using Coulomb breakup.

In order to overcome some of the experimental limitations of the available data and to provide further measures to distinguish between the conflicting model predictions, high-resolution $(\vec{p}, \vec{p}')$ experiments under 0° were performed on ^{120}Sn and ^{208}Pb as test cases. In such experiments the full E1 strength distribution between excitaion energies of about 5 to 25 MeV can be extracted with two independent techniques based on a multipole decomposition of the measured angular distributions and a combination of spin-transfer observables permitting a distinction of spinflip and non-spinflip transitions. First results are presented.

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