SYSTEMATICS AND FINESTRUCTURE OF THE PYGMY DIPOLE RESONANCE

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Beside the Giant Dipole Resonance in many nuclei additional low-lying electric dipole (E1) strength has been found below and around the particle separation energies, which is usually denoted as Pygmy Dipole Resonance (PDR). An excellent tool to investigate bound E1 excitations is the method of real-photon scattering, which has been used in the last years to perform systematic studies of E1 strength below the neutron separation energy in nuclei of different mass regions [1]. The results show a rather smooth variation of the parameters of the PDR within isotopic or isotonic chains. This led to the assumption that the PDR is a new collective mode. Various, sometimes contradictory model descriptions exist to account for the origin of the E1 strength [2]. Most of the models are able to describe the gross features of the available data of the mode equally well.
Up to now mainly integral quantities as the total strength or the centroid energy have been compared to the experimental data. However, in the photon-scattering experiments a strong fragmentation of the E1 strength is observed, which has two important consequences: First, the fragmentation will have an impact on integral quantities as every experiment has a finite sensitivity limit and second, the fragmentation itself provides another important quantity. A detailed comparison between calculations in the QPM (including complex configurations) and experimental data on the N=82 istones will be presented with an emphasis on the fragmentation of the E1 strength [3].

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