

# Isoscalar excitation of the PYGMY dipole resonance in $^{68}\text{Ni}$

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In the last years much attention has been devoted to the study of collective states in neutron-rich nuclei. In particular, the presence of electric dipole response around the nucleon binding energy, that is far from the well known Giant Dipole Resonance, is of remarkable interest [1,2].

This mode, the so-called Pygmy Dipole Resonance (PDR), although is carrying few per cent of the isovector Energy Weighted Sum Rule (EWSR) has a strong relation with the symmetry energy and it has been used as a further tool to constrain it. It is predicted to be present in almost all nuclei with neutron excess: in particular for nuclei far from the stability line. This new mode can be populated by both isoscalar and isovector probes due to the properties of its transition densities [3]. Most of these experiments, with both probes, have been performed on stable nuclei [1,2], with only two exceptions where the relativistic Coulomb excitation was used. We report here, for the first time, preliminary results on an experiment done in inverse kinematics using an unstable projectile on an isoscalar target. We performed at LNS-INFN of Catania, an experiment using a  $^{68}\text{Ni}$  beam at 40 MeV/nucleon impinging on a  $^{12}\text{C}$  target, produced by In Flight Fragmentation method in a dedicated In Flight Radioactive Ion Beams (FRIBs) transport line. The detector systems CHIMERA [4] and Farcos [5] were used to detect both gamma and charged products.

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