INVESTIGATION OF PYGMY DIPOLE RESONANCE IN IRON NEUTRON RICH EXOTIC ISOTOPES

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The electric dipole response of atomic nuclei is presently attracting large attention from the nuclear physics community. In particular the E1strength in neutron rich nuclei, located at one particle separation energy (6-12 MeV energy range) is the object of a large experimental and theoretical effort to investigate the properties and the correlations with nuclear structure[1]. The features of this strength accumulation, commonly called Pygmy Dipole Resonance (PDR), are connected with the neutron skin thickness and the symmetry energy term of the nuclear equation of state [2,3]; connections with astrophysics about neutron star structure and reactions in extreme condition scenarios are also relevant [4]. The theoretical interpretation and the collectivity of this response are still open points.

In spite of the large amount of data about E1 strength distribution in stable nuclei, very few data are available for neutron rich exotic nuclei. A measurement to search for the pygmy dipole resonance in ^{64}Fe and ^{62}Fe nuclei was performed in GSI in 2012 and concluded in 2014, during the PreSPEC –AGATA experimental campaing [5]. The PDR excitation was obtained through relativistic Coulomb excitation in inverse kinematics. This reaction mechanism coupled with the detection of gamma rays emitted by excitated nuclei with HPGe and scintillator detectors is a well established experimental technique to investigate nuclear properties in the energy region of pygmy [6]. The data analysis has shown the possibility to obtain an evaluation of the E1 strength around one particle separation energy for these nuclei. In this talk preliminary results of the data analysis concerning the Iron exotic isotopes will be presented.

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