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# Isospin mixing studied via GDR

The electric dipole (E1) response of a nucleus is mainly concentrated in the Giant Dipole Resonance (IVGDR) which is located at energies higher than the particle binding energy. The GDR in medium-heavy nuclei in a range of temperature between 1-3 MeV and in a large window of angular momentum was investigated in many experimental and theoretical works and, thus, a solid base exists. It is possible, therefore, to use the  decay of the IVGDR as a probe to study other aspects of nuclear structure as for example the restoration/breaking of the isospin symmetry. In fact, in self-conjugated nulei in a Isospin zero state, the -decay of the IVGDR is expected to be strongly reduced because of the isospin selection rules. The measurement of the IVGDR gamma decay provides a direct measurement of the degree of violation of the Isospin symmetry and therefore a direct measurement of the isospin mixing phenomena. This observable is also necessary in the estimation of the Vud term in the Cabibbo-Kobayashi-Maskawa matrix. At the INFN laboratories of Legnaro a series of experiments were performed, using a combined system of LaBr3:Ce and HPGe detectors (i.e. AGATA and GALILEO), These experiments were focused to the measurement of isospin mixing in mid mass nuclei. The results achived for 80Zr and the status of the data-analysis for the case of 60Zn will be shown and discussed. The gamma decay of the IVGDR built on ground state nuclei can be ideally measured using a higly monocromatic and intense gamma beam as that which will be provided by ELI-NP. In this case, the measurement of the photon and neutron decay of the IVGDR provides information on the decay strength, on the branching ratio and on the IVGDR wave function. In addition, it will also be possible to measure the gamma decay of the Pygmy Dipole Resonance (PDR) which shows up in the energy region 6 - 12 MeV and represents a new collective excitation mode of a dipole oscillation of neutron-skin against a core nucleus. T

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