

E1 strength measurements at iThemba LABS

iThemba LABS, South Africa, is a suitable laboratory for the experimental study of the E1 strength in nuclei. The K600 magnetic spectrometer is one of the few spectrometers in the region of 30-200 MeV with high-energy resolution and the ability to perform measurements at zero degrees. This capability enabled the study of fine structure in giant resonances and the role of deformation in these collective modes. The recent development of coincidence measurements of charged particle and γ -ray decays is a perfect combination for investigating the nature of the pygmy dipole resonance and broad excited structures in detail.

Photo-absorption cross sections and decay branching ratios of nuclei lighter than ^{56}Fe be measured by forward-angle proton inelastic scattering with the K600 magnetic spectrometer coupled to the charged particle detector CAKE and gamma spectrometer ALBA. These experiments will be part of an international joint project PANDORA (Photo-Absorption of Nuclei and Decay Observation for Reactions in Astrophysics), aiming at systematic measurement on electric dipole excitation strengths and decay properties of stable nuclei below the mass of $A=56$. The project is primarily motivated by the study of the photo-disintegration and energy loss processes of ultra-high energy cosmic ray (UHECR) nuclei in extra-galactic propagation.

In this talk, I will present recent results of experiments conducted at iThemba LABS on giant and pygmy resonances and I will give a brief overview of the PANDORA project.

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