

Nuclear structure studies at VECC using INGA

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The study of the excited states in nuclei is the key to understand not only the structure of nuclei but also the modes of generation of angular momentum in nuclei and different quantum mechanical symmetries in nuclei. In order to predominantly excite a particular set of states in a nucleus, one has to choose a suitable reaction. For example, the heavy-ion induced fusion reaction mostly populates the high-spin yrast states while the lower spin and non-yrast states are populated mostly by light-ion induced reactions. Moreover, the higher spin states of heavy nuclei near the stability line can only be populated by light-ion induced reactions. At VECC, the K-130 cyclotron can provide both heavy ion and light ion beams at higher energies which gives the opportunity to access a wide range of nuclei in the nuclear chart. Therefore, a variety of structural phenomena can be experimentally addressed. Recently, an experimental campaign using the INGA (Indian National Gamma Array) setup with up to 10 Compton suppressed clover HPGe Detectors has been completed at VECC with an aim to exploit the advantages of the unique beams available at VECC in the study of the excited states in nuclei by γ -ray spectroscopy technique. A PIXIE-16 based digital data acquisition system, setup by the UGC-DAE-CSR, Kolkata Centre, was used in this campaign. A total of 23 experiments were carried out by different users from Universities and Institutions in India and abroad. The highlights of some of the experiments and the results will be presented.

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