

# First measurements using gas-filled mode of HYbrid Recoil mass Analyzer (HYRA) at IUAC

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## Abstract

HYbrid Recoil mass Analyzer (HYRA), the new generation reaction analyzer capable of operating in 'gas-filled mode' for efficient detection of heavy 'evaporation residues' (ERs) and in 'vacuum mode' for accessing nuclei around mass 50-100 amu in inverse kinematics, is being set up at Inter University Accelerator Centre (IUAC) with funds from the Department of Science and Technology (DST), Government of India. The first stage of HYRA, operable in 'gas-filled mode' to select sparsely produced, heavy evaporation residues surviving dominant fission channel or as 'momentum achromat' for production of secondary unstable beams of light nuclei, has been commissioned. The first successful experimental measurements have recently been carried out using the gas-filled mode to select ERs from  $^{200}\text{Pb}^*$  compound nucleus as calibration system and those from  $^{210}\text{Rn}^*$  compound nucleus down to energies well below the 1D-BPM Coulomb barrier in an user experiment. Excellent rejection of primary beam and target-like particles, several-fold transmission of ERs in comparison with the existing RMS, HIRA and alpha particles from decay of ERs at the focal plane have been observed.

In this talk, the design and performance of HYRA will be elaborated in detail and the possibilities for isomer decay and ER gated prompt gamma ray spectroscopy measurements in conjunction with Indian National Gamma Array (INGA) will be outlined.

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