

From GASP to ROSPHERE: Gamma-ray spectroscopy at NIPNE –Bucharest

Tuesday, 11 June 2013 14:00 (30 minutes)

First, a brief overview of some outstanding results obtained with GASP within the Italian-Romanian collaboration will be given. Then, recent developments for gamma-ray spectroscopy at the Tandem Laboratory in Bucharest are presented. The ROSPHERE (ROmanian array for SPectroscopy in Heavy ion REactions) array, now in use at this laboratory, is a 'sphere' with 25 detector positions. HPGe of ~50% relative efficiency, with anti-Compton shields, can be used in these positions, for 'classical' gamma-ray spectroscopy experiments, like gamma-gamma coincidences and DSAM and plunger lifetime determinations. Until now, however, the most successful use of this setup was that as a mixed array, with both HPGe detectors and LaBr₃:Ce scintillator detectors. The fast timing properties and relatively good energy resolution of the lanthanum bromide detectors allowed the extension of the fast timing method for nuclear lifetime determinations to in-beam experiments with fusion-evaporation, incomplete fusion and fragmentation reactions with alpha particle and various heavy ion beams. Lifetimes of nuclear excited states can be measured in the domain from several tens of ps to ns, a range that only partially overlaps with that of other methods and usually highlights interesting nuclear structure effects. Some physics cases will illustrate the performances of this array.

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