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## Lifetime Measurements of Excited States in $^{146}\text{Sm}$ .

This work reports on the utilisation of gamma-ray coincidences between germanium and cerium-doped lanthanum tri-bromide  $\text{LaBr}_3(\text{Ce})$  scintillation detectors for the determination of electromagnetic transition rates in the pico to nanosecond regime. The technique utilises the high-quality full-energy peak resolution of the  $\text{LaBr}_3(\text{Ce})$  detectors coupled with their excellent timing responses in order to study discrete energy gamma-ray cascades from nuclei populated using the  $^{139}\text{La}(11\text{B}, 4\text{n})^{146}\text{Sm}$  fusion-evaporation reaction. This study was carried out at the Tandem van de Graaff accelerator laboratory in Bucharest, Romania [2]. The emitted gamma rays were detected using the mixed ROSPHERE array of  $\text{LaBr}_3(\text{Ce})$  and HPGe detectors. Lifetimes of excited states in the  $^{146}\text{Sm}$  will be presented, together with their interpretation within the nuclear shell model configurations of near-yrast excitations in  $^{146}\text{Sm}$ .

[1] J.-M.Regis et al., Nucl. Inst. Meth. Phys. Res. A 622 (2010) 83-92.

[2] N. Mărginean, et al Eur. Phys. J. A 46, 329–336 (2010).

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