Emerging results from the ν-Ball2 experimental campaign

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The ν-Ball2 spectrometer is a state-of-the-art hybrid gamma-ray spectrometer that has been developed and constructed at the ALTO facility of IJC Lab in Orsay during 2022 and 2023. It consists of several coupled detectors and devices, including Gammapool high efficiency Ge clovers, the FATIMA fast-timing array [1], eight clusters of the PARIS array [2] and the DSSD segmented silicon detector from Warsaw [3]. A major focus of the experimental campaign has been to perform gamma ray spectroscopy of nuclear fission, induced by fast neutrons from the LICORNE source [3], light charged particles and heavy ion beams from the ALTO tandem accelerator. These reactions are used as tools to study both the fission process itself and as a production mechanism for studying exotic neutron-rich nuclei and the lifetimes of their excited states. Open questions in fission have been addressed, such as the evolution of fragment yield distributions in the sub-actinide region [4] and the emission of high energy gamma rays in nuclear fission with potential population of collective resonances (PDR, GDR, etc.) in the emerging fragments [5]. Additional questions on possible angular correlations between fission fragment partner spins, and gamma ray angular distributions with respect to the fission axis are currently being investigated [6]. An overview of the ν-Ball2 experimental campaign will be given and emerging results from these experiments will be presented.

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