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## Fission studies with the nu-Ball2 array

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A series of recent experiments to perform high-resolution gamma ray spectroscopy of nuclear fission have been carried out with the  $\nu$ -Ball2 spectrometer at the ALTO facility of IJC Lab in the framework of the EURO-LABS transnational access project [1][2].  $\nu$ -Ball2 is a state-of-the-art hybrid array developed and constructed at ALTO and used by a large international collaboration. Several open questions are currently being addressed, such as the evolution of fragment yield distributions in the sub-actinide region [3], the emission of high energy gamma rays in nuclear fission with potential population of collective excitations (PDR, GDR, etc.) in the emerging fragments [4]. The experiments have also explored other outstanding questions, such as the angular momentum carried away by neutron emission [5] and angular correlations between the spins of fission fragment partners and measurements of angular distributions of gamma rays with respect to the fission axis [6][7]. Finally, the potential energy landscape before fission occurs can also be studied by gamma spectroscopy of fission shape isomers [8]. An overview of these new studies from the  $\nu$ -Ball2 experimental campaign will be given and selected results will be presented along with future perspectives.

### References

- [1] G. Pasqualato and J.N. Wilson, Nuclear Physics News, 34 16-20, (2024)
- [2] <https://web.infn.it/EURO-LABS/>
- [3] K. Miernik et al. Phys. Rev. C 108, 054608 (2023)
- [4] H. Makii et al. Phys. Rev. C 100, (2019) 044610
- [5] D. Gjestvang, J.N. Wilson et al. Phys. Rev. C 108, 064602 (2023)
- [6] J. Randrup, Phys. Rev. C 106, (2022) L051601
- [7] G. Scamps et al., Phys. Rev. C 108, L061602 (2023)
- [8] C. Hiver, J.N. Wilson et al., Acta Physica Polonica Vol. 18, 2-A25 (2025)

### Type of contribution

Invited Speaker

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