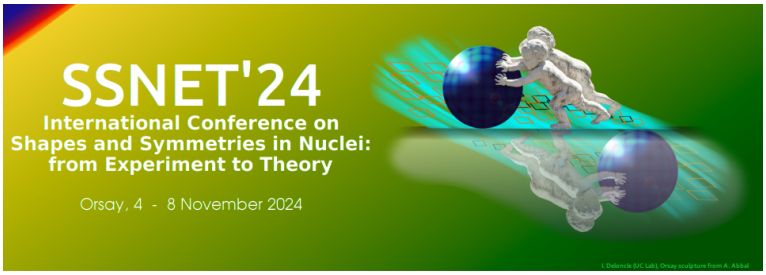

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Multistep Coulomb excitation of 116,106Cd: emerging quadrupole collectivity

mardi 5 novembre 2024 11:30 (20 minutes)

Nuclear collectivity has been thought to emerge through spherical quadrupole vibrations, especially in transitional regions between shell closures and deformed nuclei. The Cd isotopes ($Z = 48$) were long considered textbook examples of vibrational nuclei. However, in recent years this narrative has been challenged, with elecromagnetic matrix element data showing major discrepancies with the vibrational model [1]. Results from multi-step Coulomb excitation data of ^{106,116}Cd on ^{208}Pb will be presented [2]. Excitation of many low-lying states, including two excited 0^+ states was observed. The experimental $E2$ matrix elements are used to construct $E2$ rotational invariants for the ground- and low-lying excited states, providing a model independent view of nuclear shapes in the Cd isotopes. The rotational invariant behaviour as a function of spin can be compared to, and test state-of-the-art nuclear models. The experiments were performed using the GRETINA-CHICO2 arrays at Argonne National Laboratory, using the ATLAS accelerator.

[1] P. E. Garrett, T. R. Rodriguez, A. Diaz Varela *et al.*, Phys. Rev. Lett. **123**,142502 (2019)
[2] T. J. Gray, J. M. Allmond, R. V. F. Janssens *et al.*, Phys. Lett. B **834**, 137446 (2022)

Author: GRAY, Timothy (University of Tennessee & ORNL, Knoxville, USA)

Orateur: GRAY, Timothy (University of Tennessee & ORNL, Knoxville, USA)

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