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Shape coexistence studied with Coulomb excitation and AGATA

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The history of Coulomb-excitation measurements with AGATA dates back to the very first physics experiment with this array, which took place in April 2010 and aimed at investigation of a highly-deformed structure in ^{42}Ca [1,2]. The measurement provided magnitudes and relative signs of numerous E2 matrix elements coupling the low-lying states in ^{42}Ca. The shape parameters obtained for the 0_2^+ and 2_2^+ states confirm that the excited structure possesses a strikingly large elongation, similar to that established for superdeformed bands in this mass region, and a slightly non-axial character. In contrast, those for the ground state are consistent with large fluctuations about a spherical shape.

During the AGATA campaign at GANIL, Coulomb-excitation data were collected as a by-product of experiments performed at near-barrier beam energies. Notably, the analysis of slightly "unsafe" Coulomb-excitation data on ^{106}Cd, collected during an experiment aiming at lifetime measurements in ^{106,108}Sn [3], provides information on the collectivity of the presumably oblate structure built on the 0_3^+ state, as well as on the role of octupole correlations in this nucleus [4].

In the recent months, three Coulomb-excitation measurements were performed with AGATA at LNL, aiming at verification of the multiple shape-coexistence scenario in ^{110}Cd and ^{74}Se, and that of the type-II shell evolution in ^{96}Zr. The status of the on-going analysis will be briefly presented.

[1] K. Hadyńska-Klęk *et al.*, Phys. Rev. Lett. 117, 062501 (2016).
[2] K. Hadyńska-Klęk *et al.*, Phys. Rev. C 97, 024326 (2018).
[3] M. Siciliano *et al.*, Phys. Lett. B 806, 135474 (2020).
[4] D. Kalaydjieva, PhD thesis, Université Paris-Saclay, 2023.

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