Spectroscopy of negative parity bands in ^{105}Pd

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In palladium isotopes with triaxially deformed nuclear shape lying in the A∼100 mass region the appearance of exotic motions, such as gamma vibrations, chiral and wobbling rotations, are expected. Indeed, a soft gamma band has been identified in ^{104}Pd [1] and a wobbling band has been found in ^{105}Pd [2]. However, chiral partner bands have not been observed in palladium isotopes to date, although they are expected.

We aimed at searching candidates for chiral and 2-phonon wobbling rotations in nucleus ^{105}Pd investigating its negative-parity medium- and high-spin structure. The excited states were studied through the ^{96}Zr(^{13}C,4n)^{105}Pd reaction at incident energies of 51 and 58 MeV, using the EUROBALL IV γ-ray spectrometer in conjunction with the DIAMANT charged particle array. New bands have been observed and the previously reported bands have been extended to higher energies and spins. Altogether six decoupled bands with E2 transitions and one strongly coupled band with M1 + E2 transitions have been found [3]. The obtained energy spectra and B(M1)/B(E2) ratios are compared with results of quantum particle rotor model calculations. The properties of the identified bands and their interpretation will be presented.

[1] D. Sohler *et al.*, Phys. Rev. C **85** (2012) 044303.
[2] J. Timár *et al.*, Phys. Rev. Lett. **122** (2019) 062501.
[3] B. Kruzsicz *et al.*, to be submitted to Phys. Rev. C.