Contribution ID: **30** Type: **Semi-plenary talk (30 min + 5 min questions)**

LOW-ENERGY M1 STATES IN DEFORMED NUCLEI: SPIN SCISSORS OR SPIN-FLIP?

Thursday, 14 July 2022 10:00 (30 minutes)

A low-energy magnetic dipole (M1) spin-scissors resonance (SSR) located just below the orbital scissors resonance (OSR) was predicted in deformed nuclei within the Wigner function moments (WFM) approach, see [1,2] and references therein. We analyze this prediction for 160,162,164Dy and 232Th using fully self-consistent Skyrme quasiparticle random phase approximation (QRPA) method [3]. Accuracy of our calculations is confirmed by a good description of M1 spin-flip giant resonance in these nuclei. It is shown that Dy isotopes indeed have at 1.5–2.4 MeV 1+ states with a large M1 spin strength. These states are almost fully exhausted by a few 2qp low-orbital (l = 2, 3) spin-flip configurations. In contrast to WFM deformation-induced spin-scissors picture, our calculations show that deformation is not the origin of the low-energy spin M1 states but only a factor affecting their features. This conclusion is illustrated by simple arguments in terms of mean-field spectra and nuclear current distributions.

1. E.B. Balbutsev, I.V. Molodtsova, and P. Schuck, Nucl. Phys. A 872, 42 (2011).
2. E.B. Balbutsev, I.V. Molodtsova, and P. Schuck, Phys. At. Nucl. 83, 212 (2020).
3. V.O. Nesterenko, P.I. Vishnevskiy, J. Kvasil, A. Repko, and W. Kleinig, Phys. Rev. C 103, 064313 (2021).

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

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