Contribution ID: **19** Type: **not specified**

Isovector-E2 strength of the scissors mode of 152Sm

Wednesday, 13 July 2022 12:50 (20 minutes)

The nucleus ^{152}Sm is well known to be located at the $N = 90$ quantum shape-phase transition (QSPT) boundary. Since the scissors mode (SM) is a collective, isovector excitation, its decay characteristics depend on the proton-neutron residual interactions and are sensitive to the QSPT. The SM is known for its large $M1$-excitation strength, however, data on isovector $E2$ properties are sparse [1]. The SM of ^{152}Sm was investigated in a nuclear resonance fluorescence experiment performed at the High-Intensity γ-Ray Source with a quasi-monoenergetic, polarized photon beam with an energy of 2.99(5) MeV. Emitted photons were detected by four high-purity germanium detectors positioned at angles sensitive to the multipolarities of the decay radiation of 1^π states. The isovector $E2$ transition of the SM of ^{152}Sm to the first 2^+ state has been deduced from the $E2/M1$ multipole mixing ratio of the $1^+_{sc} \rightarrow 2^+_1$ transition and its previously known transition rate. Experimental results are compared to predictions of the interacting boson model 2, yielding local values for proton and neutron effective quadrupole boson charges [2].
*Supported by the DFG under grant No. SFB 1245

[1] T.Beck *et al.*, Phys. Rev. Lett. **118** (2017) 212502
[2] K. E. Ide *et al.*, Phys. Rev. C **103** (2021) 054302

Primary authors: IDE, Katharina E. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); BECK, T. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); BERGER, M. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); FINCH, S. (Department of Physics, Duke University and Triangle Universities Nuclear Laboratory); FRIMAN-GAYER, U. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); KLEEMANN, J. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); KRISHICHAYAN (Department of Physics, Duke University and Triangle Universities Nuclear Laboratory); LÖHER, B. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); PAPST, O. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); PIETRALLA, N. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); SAVRAN, D. (ExtreMe Matter Institute EMMI and Research Division, GSI Helmholtzzentrum für Schwerionenforschung); TORNOW, W. (Department Department of Physics, Duke University and Triangle Universities Nuclear Laboratory); WEINERT, M. (Institut für Kernphysik, Universität zu Köln); WERNER, V. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); WIEDERHOLD, J. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics); ZILGES, A. (Institut für Kernphysik, Universität zu Köln)

Presenter: IDE, Katharina E. (Technische Universität Darmstadt, Dept. of Physics, Institute for Nuclear Physics)

Session Classification: Symmetries of interacting boson and/or fermion systems

Track Classification: Symmetries of interacting boson and/or fermion systems