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PROPERTIES OF GAMOW-TELLER AND CHARGE-EXCHANGE GIANT SPIN-MONOPOLE RESONANCES IN MEDIUM-HEAVY CLOSED-SHELL PARENT NUCLEI: A SEMIMICROSCOPIC DESCRIPTION

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Properties of giant resonances (GRs) associated with high-energy particle-hole (p-h) excitations in medium-heavy nuclei are described by a number of characteristics and parameters. Main characteristics include the energy-averaged strength function and "projected" transition density, both related to an appropriated single-particle external field (probing operator), and strength functions of direct one-nucleon decay. Being considered in a wide excitation-energy intervals, these characteristics determine, in particular, the GR peak energy, fractions of the respective sum rule, probabilities of direct one-nucleon decay.
In this work, we present a theoretical study of the main properties of Gamow-Teller and charge-exchange (isovector) giant spin-monopole resonances (GTR and $IVGSMR^{()}$, respectively) in a few medium-heavy closed-shell parent nuclei. The study is performed within the semi-microscopic p-h dispersive optical model (PHDOM), in which the main relaxation modes of p-h states associated with GRs are together taken into account. Actually, PHDOM is a microscopically-based extension of the standard and nonstandard versions of the continuum-random-phase-approximation on taking (phenomenologically and in average over the energy) the spreading effect into account. Formulation of PHDOM and its implementations to describing a few of isoscalar and isovector GRs in medium-heavy closed-shell nuclei can be found in Ref. [1] and references therein. Within the model. a realistic partially self-consistent phenomenological mean field and Landau-Migdal p-h interaction are used as input quantities.
In this work, PHDOM is adopted and then implemented to describing main properties of GTR and $IVGSMR^{()}$ in the ^{48}Ca, ^{90}Zr, ^{132}Sn, and ^{208}Pb parent nuclei. Calculation results are compared with available experimental data. Most of the results can be found in Ref [2].

1. M.L. Gorelik, S. Shlomo, B.A. Tulupov, and M.H. Urin, Phys. Rev. C103, 034302 (2021).
2. V.I. Bondarenko, M.H.Urin, http://arxiv.org/abs/2201.02965.

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

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