DIRECT ONE-NEUTRON DECAY OF THE ISOSCALAR GIANT DIPOLE RESONANCE IN MEDIUM-HEAVY SPHERICAL NUCLEI: A SEMI-MICROSCOPIC DESCRIPTION

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Direct one-nucleon decay of giant resonances (GRs) is the subject of permanent (but not-too-intensive) experimental and theoretical studies. They allow one to get information on GR structure and decay mechanisms. Decay probabilities are usually deduced from a common analysis of cross sections of direct inclusive and "decay" reactions. In Ref. [1], direct one-neutron decay of Isoscalar Giant Dipole Resonance (ISGDR) in ^{90}Zr, ^{116}Sn, and ^{208}Pb have been studied via the (α, α')- and $(\alpha, \alpha' n)$-reactions. To some extent, this study has been stimulated by predictions made in Ref. [2] for partial branching ratios b_μ of direct one-neutron ISGDR decay accompanied by population of neutron-hole states μ^{-1} in product nuclei. A simple extension of standard and nonstandard continuum-RPA versions to taking phenomenologically the spreading effect into account has been exploited in Ref. [2]. The experimental values $b = \sum_\mu b_\mu$ (the sum is taken over a few valence neutron-hole states) were found in Ref. [1] to be essentially less than the respective predicted values.

In the present work, we, first, specify the approach of Ref. [2], employing for evaluation of b_μ values the semi-microscopic Particle-Hole Dispersive Optical Model (see, e.g., Ref. [3] and references therein) and, secondly, use the alternative definition for b_μ employed in Ref. [1]. These points allow us to reduce markedly the difference between theoretical and experimental b values related to direct one-neutron decay of ISGMR in the above-mentioned nuclei.

This work is partially supported by the Russian Foundation for Basic Research, under Grant no. 19-02-00660 (M.L.G., B.A.T., M.H.U.), by the US Department of Energy, under Grant no. DE-FG03-93ER40773 (S.S.), and by the Program "Priority – 2030" for National Research Nuclear University "MEPhI" (M.H.U.).

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