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The role of spin-spin forces in calculations of transition probabilities between the first one-phonon states.

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The self-consistent method for studying second-order anharmonic effects, within the framework of many-body quantum theory, is used for the first time to investigate the role of spin-spin forces in the probabilities of transitions between low-lying one-phonon states. Our approach includes accounting for: 1) self-consistency between the mean field and effective interaction based on the use of the energy density functional method with the proven parameters of Fayans functional DF3-a [1], 2) three-quasiparticle correlations in the ground state, 3) nuclear polarizability effects and 4) spin-spin interactions. E1-transitions between one-phonon 3-1 and 2+1 states in semimagic tin isotopes were studied. Good agreement with experiment [2] was obtained. It is shown that three-quasiparticle correlations in the ground state make a significant contribution to the value under study, as in our previous calculations for the EL transitions between first 3- and 2+ states in magic nuclei [3]. The specificity of this problem in nuclei with pairing and the effects of the spin components of the phonon creation amplitude are considered.

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