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Spectroscopic investigation of low-lying T=0,1 states in self-conjugate ^{62}Ga

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The assignment of the first 2^+ state in ^{62}Ga has been a subject of debate in the last decades due to its implications in triplet energy difference systematics in this mass region[1]. To clarify this, an experiment was performed at the IFIN-HH 9-MV Tandem accelerator using the ROSPHERE[2] array in a mixed configuration of $LaBr_3$(Ce), HPGe and liquid scintillator neutron detectors. Excited states in ^{62}Ga were populated through the ^{58}Ni(^{6}Li, $2n$) fusion-evaporation reaction. The precise angular anisotropy ratio determined in this experiment for a 978.1-keV transition to the ground state in ^{62}Ga reveals that we have indeed populated the lowest-lying 2^+ state. This state's newly assigned spin and parity positions the $A = 62$ isovector triplet within the typical range of values in the $T = 1$, $J^\pi = 2^+$ fractional triplet energy difference systematics. The interplay between the isospin-symmetry breaking and shape-coexistence effects in the $A = 62$ isovector triplet was theoretically treated within the beyond-mean-field complex excited Vampir variational model. Theoretical results indicate agreement with the experimental data on the discussed observables.

[1] T.W. Henry *et al.*, Phys. Rev. C 92, 024315 (2015).
[2] D. Bucurescu *et al.*, NIM A 837 (2016).

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