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Shell-model description of $N = Z$, $A \sim 70$ nuclei MICHIO HONMA, University of Aizu, TAKAHARU OTSUKA, University of Tokyo, TAKAHIRO MIZUSAKI, Senshu University, MORTEN HJORTH-JENSEN, University of Oslo
— We present the results of shell-model calculations in the model space consisting of four single-particle orbits $1p_{3/2}$, $0f_{5/2}$, $1p_{1/2}$ and $0g_{9/2}$ using a new semi-microscopic effective interaction. The structure of $N = Z$ nuclei around ^{68}Se is discussed focusing especially on the role of the $g_{9/2}$ orbit. The development of the band structure is interpreted in terms of successive excitations of nucleons into the $g_{9/2}$ orbit. The triaxial/γ-soft structure in ^{64}Ge and the prolate/oblate shape-coexistence in ^{68}Se are predicted, showing a good correspondence with the experimental data. The isomeric states in ^{66}As and ^{70}Br are obtained with the structure of an aligned proton-neutron pair in the $g_{9/2}$ orbit. In spite of the modest model space, the new interaction turns out to describe rather well properties related to the $g_{9/2}$ orbit in various cases including moderately deformed nuclei.

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