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The spectrum of ^{18}O and ^{40}Ca nuclei in terms of the multiconfigurational dynamical symmetry

The multi-configurational dynamical symmetry (MUSY) serves as a unifying framework that links the fundamental structure models of atomic nuclei: the shell, collective, and cluster models [1, 2]. It constitutes a composite symmetry where each configuration possesses a usual [U(3)] dynamical symmetry and an additional symmetry that connects these configurations among themselves. As a consequence of the latter feature, it enables the connection between wave functions of different configurations, such as shell, quartet, or cluster configurations.
We have applied MUSY to the ^{18}O and ^{40}Ca nuclei for the unified description of the complete spectrum, including different configurations and energy valleys. Furthermore, we have obtained shape isomers from the study of the Stability and self-Consistency of SU(3) Symmetry (SCS) [3].

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