Contribution ID: **3** Type: **not specified**

No-Core MCSM calculation for ^{10}Be and ^{12}Be low-lying spectra

Thursday, 3 November 2011 16:00 (30 minutes)

The low-lying excited states of ^{10}Be and ^{12}Be are investigated within a no-core Monte Carlo Shell Model (MCSM) framework employing a realistic potential obtained via the Unitary Correlation Operator Method. The excitation energies of the 2_1^+ and 2_2^+ states and the B(E2; $2_1^+ \rightarrow 0_{g.s.}^+$) for ^{10}Be in the MCSM with a treatment of spurious center-of-mass motion show good agreement with experimental data. The deformation properties of the 2_1^+ , 2_2^+ states for ^{10}Be and of the 2_1^+ state for ^{12}Be are studied in terms of quadrupole moments, E2 transitions and the single-particle occupations. The E2 transition probability of ^{10}C, the mirror nucleus of ^{10}Be, is also presented. The triaxial deformation of ^{10}Be is tested by the B(E2; $2_2^+ \rightarrow 2_1^+$) value. The removal of the spurious center-of-mass motion shifts the 1_1^- level significantly, improving agreement with experiment.

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