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Cluster orbitals for the mirror nuclei ^{7}Li and ^{7}Be[1] CHRYSOVALANTIS CONSTANTINOU, Yale University, MARK A. CAPRIO, PATRICK J. FASANO, University of Notre Dame — Certain light nuclei are dominated by alpha particle clustering. In these nuclei, the alpha clusters form a molecular like structure and any additional nucleon(s) are orbiting in the potential created by the alpha clusters. The mirror nuclei ^{7}Li and ^{7}Be can be viewed as a ^{8}Be core plus a proton or neutron hole, respectively. We derive the single-particle orbitals for ^{7}Li and ^{7}Be by solving the single-particle Schrödinger equation for a proton (neutron) hole in the potential created by the ^{8}Be core. Specifically, we derive the energies of the ground and excited states, the radii, and electromagnetic transition probabilities. We also compare the calculated observables against *ab initio* no-core configuration interaction calculations using realistic interactions.

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