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Title: Open quantum systems within the Gamow Shell Model

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Within the complex-energy configuration interaction framework, we study correlations of valence neutrons to explain the behavior of charge radii in the neutron halo nuclei $^{6,8}\text{He}$. We find that the experimentally observed decrease of the charge radius between ^6He and ^8He is caused by a subtle interplay between three effects: dineutron correlations, a spin-orbit contribution to the charge radius, and a core swelling effect. We demonstrate that two-neutron angular correlations in the 2^+_{1st} resonance of ^6He differ markedly from the ground-state correlations in $^{6,8}\text{He}$. We calculate the charge radius of ^8He in the full GSM space with the help of the Density Matrix Renormalization Group (DMRG) technique taking advantage of the supercomputing facilities at UT and ORNL.