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A diynamical model for halo nuclei and two-nucleon transfer reaction

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The peculiar properties of the halo nuclei 11Li and 12Be can be successfully interpreted in the framework of a dynamical model based on the interweaving of single-particle levels with the collective vibrations of the system, leading to a substantial admixture of phonons in the ground state. This interweaving induces an attractive interaction between the two-halo neutrons that in the model is crucial to reproduce quantitatively the position of the single-particle levels and the two-neutron separation energy.
A recent two-neutron transfer experiment, performed with a beam of 11Li and populating both the ground and the first excited state of 9Li showed evidence for the quadrupole mixing in the ground state wave function. A second-order DWBA calculation based on our microscopic wavefunction for 11Li is able to reproduce both the angular distribution and the absolute value of the cross section.

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