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Nuclear Halos and Efimov Effect: A three-body approach

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The advent of Radioactive Ion Beam facilities and subsequent explosive growth in the studies of neutron rich nuclei near the drip line has opened up new vistas in modern nuclear physics. The discovery of halo structures, both 1-neutron and 2-neutron halos, in neutron-rich, light nuclei has been a significant development in nuclear structure studies. The 2-neutron halo nuclei can have both Borromean or non-Borromean properties and can be ideally modeled as three-body systems. A variety of theoretical techniques have been applied over the years to investigate the structural properties of 2-neutron halo nuclei. Of all these techniques, three-body approaches appear to be very successful and effective. In this talk we will summarise our efforts, over the years, to calculate different structural properties of 2-n halo nuclei, like, 11Li, 14Be, 20C etc. We will also talk about our search for the elusive Efimov effect in such nuclei. We will show the possible presence of Efimov states in certain non-Borromean 2n halo nuclei, their evolution to resonances with increasing neutron-core (2-body) interaction and emergence as an asymmetric Fano resonance.

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