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Investigating 8B structure for astrophysical applications

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We investigate the structure of proton-rich isotope 8B in the Fermionic Molecular Dynamics (FMD) formalism. The structure of 8B is important for stellar nucleosynthetic reaction rates in the pp chain and for determining the high-energy solar neutrino flux. 8B is difficult to access experimentally, making microscopic calculations especially valuable for determination of associated reaction rates. Clustering plays an important role in the structure of 8B, and FMD is especially well-suited for modelling clustering. For a multiconfiguration treatment we construct the many-body Hilbert space from antisymmetrised angular-momentum projected 8-particle states that are minimised in energy under constraints like matter-, proton- and neutron-radius or quadrupole moments, and add 7Be+p clusters. Our current results suggest a prolate 8B; with a tendancy towards formation of a proton halo.

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