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Dynamics of weakly-bound molecules

Monday, 31 July 2023 09:00 (35 minutes)

The helium dimer is extremely weakly bound. Specifically, two bosonic helium-4 atoms support a single bound state with binding energy of approximately 1.5mK; no rotationally excited states are supported. The mixed isotope dimer (one helium-4 atom and one helium-3 atom), in contrast, does not support a bound state at all. In the trimer sector, three helium-4 atoms support two bound states. The ground state is about 100 times more strongly bound than the dimer while the excited Efimov state has a binding energy that is comparable to that of the dimer. The excited trimer state disappears upon isotope substitution. The system consisting of two helium-4 atoms and one helium-3 atom supports only a single bound state. The extremely weakly bound nature of small helium molecules makes them intriguing candidates for dynamical studies. This talk will discuss the helium and trimer dimer dynamics that ensues in response to a short laser kick.

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