

Abstract Submitted
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Quantum Sticking of Atoms on Membranes DENNIS CLOUGHERTY, University of Vermont — A continuum model for low-energy physisorption on a membrane under tension is proposed and studied with variational mean-field theory. A discontinuous change in the energy-dependent sticking coefficient is predicted under certain conditions. This singularity is a result of the bosonic orthogonality catastrophe of the vibrational states of the membrane. The energy-dependent sticking coefficient is predicted to have exponential scaling in $1/E$ above the singularity. The application of this model to the quantum sticking of cold hydrogen to suspended graphene is discussed. The model predicts that a beam of atomic hydrogen can be completely reflected by suspended graphene at ultralow energies.

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