Dissipative Effects on Quantum Sticking[1] YANTING ZHANG, DEN-
NIS CLOUGHERTY, University of Vermont — Using variational mean-field theory,
many-body dissipative effects on the threshold law for quantum sticking and reflec-
tion of neutral particles are examined. For the case of an ohmic bosonic bath, we
study the effects of the infrared divergence on the probability of sticking and obtain
an analytic expression for the rate of sticking as an asymptotic expansion in the
incident energy E. The low-energy threshold law for quantum sticking is found to
be robust with respect to many-body effects and remains a universal scaling law to
leading order in E. Non-universal many-body effects alter the coefficient of the rate
law and the exponent of a subdominant term.

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