Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Bose polarons: Dynamical decay and RF signatures JOHN CORSON, JOHN BOHN, JILA, NIST, and the University of Colorado — Interactions of a single impurity with a quantum many-body environment are known to alter the character of the impurity, thereby forming a "quasiparticle". The condensed matter tradition often identifies quasiparticles as poles of a Green function in the complex plane, a notion whose sophistication sometimes obscures the underlying physics. The problem of a single quantum impurity in a Bose condensate, or Bose polaron, is an illustrative example where the meaning of the impurity Green function, and hence the quasiparticle itself, becomes especially transparent. Using direct diagonalization in a truncated Hilbert space, we examine the dynamical evolution and quasiparticle decay of the repulsive Bose polaron. This approach also allows us to simulate RF spectroscopy across a Feshbach resonance and outside the linear regime, as well as account for motional and thermal effects in a harmonic trap.

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Date submitted: 29 Jan 2016 Electronic form version 1.4