

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Feshbach resonances in optical lattices DENNIS DICKERSCHIED,
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COLLABORATION — In the last few years there has been much excitement in the
field of ultracold atomic gases. In a large amount this is due to the use of so-called
Feshbach resonances and, in addition, the use of an optical lattice for the atoms.
Recently, the first steps have been made to experimentally combine these techniques,
which can both be used to tune the interactions between the atoms. Motivated by
these developments, we show that the physics of these systems is described by a
generalized Hubbard model for which the microscopic parameters are determined by
the details of the lattice and the experimentally known parameters of the Feshbach
resonance in the absence of the optical lattice. As a particular application we also
discuss the phasediagrams of a Bose gas and a Bose-Fermi mixture near a Feshbach
resonance in an optical lattice.

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Date submitted: 30 Nov 2005

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