

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Feshbach-Einstein condensates¹ VALY ROUSSEAU, PETER DENTENEER, Instituut-Lorentz, University of Leiden (The Netherlands) — We investigate the phase diagram of a two-species Bose-Hubbard model describing atoms and molecules on a lattice, interacting via a Feshbach resonance. We identify a region where the system exhibits an exotic super-Mott phase and regions with phases characterized by atomic and/or molecular condensates. Our approach is based on a recently developed exact quantum Monte Carlo algorithm, the Stochastic Green Function (SGF) algorithm with tunable directionality. We confirm some of the results predicted by mean-field studies, but we also find disagreement with these studies. In particular, we find a phase with an atomic but no molecular condensate, which is missing in all mean-field phase diagrams.

¹This work is part of the research program of the Stichting voor Fundamenteel Onderzoek der Materie (FOM), which is financially supported by the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO).

Valy Rousseau
Instituut-Lorentz, University of Leiden (The Netherlands)

Date submitted: 11 Nov 2008

Electronic form version 1.4