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Quench Dynamics of the Bose Condensate[1] YIJUE DING, FRANCIS ROBICHEAUX, CHRIS H. GREENE, Department of Physics, Purdue Universty, West Lafayette IN 47907 — Unlike the extensively explored unitary Fermi gases, very few studies have been conducted with a strongly interacting Bose gas. The experimental difficulty lies with the high three-body recombination rate, which scales as n^2a^4 for a less than the atom-atom average separation. Recently, the JILA group achieved a quasi steady unitary state for timescales smaller than the atom loss timescale by ramping the magnetic field instantly close to a Feshbach resonance. We apply a renormalized mean field theory, in which the two body interaction depends on the interparticle distance near unitarity, to study the unitary Bose gas. This renormalization has predicted some convincing results for the Fermi gas [2]. We solve the time dependent Gross-Pitaevskii equation to understand the non-equilibrium dynamics of this degenerate Bose gas. We will also discuss the oscillations induced by a quantum quench [3].

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Yijue Ding
Department of Physics, Purdue Universty, West Lafayette IN 47907

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