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Phase Diagrams for a Fermi Gas with a Feshbach Resonance TETSURO NIKUNI, Tokyo University of Science, NICOLAI NYGAARD, JAMES E. WILLIAMS, CHARLES W. CLARK, National Institute of Standards and Technology — We calculate the phase diagram for a system of Fermi atoms coupled to bosonic molecules by a Feshbach resonance. This work extends the recent work [Williams et al., *New J. Phys.* 6, 123 (2004)] on the phase diagrams for an ideal gas mixture to include the effect of the resonant interactions using the mean-field theory. We show the paths traversed in the phase diagrams when the molecular energy is varied either suddenly or adiabatically, and discuss the adiabatic phase diagrams obtained in recent experiments on the BCS-BEC crossover.

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