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Stability and Properties of the Polaron Condensate in a Strongly Interacting Boson-Fermion Mixture ZENG-QIANG YU, SHIZHONG ZHANG, HUI ZHAI, Institute for Advanced Study, Tsinghua University, China — In this work we study dilute bosons embedded in a single component Fermi sea across a boson-fermion wide Feshbach resonance using a single channel model. The ground state is a condensation of bosonic polarons, and its stability requires that the interaction strength between bosons exceeds a critical value, which is a universal number at boson-fermion resonance and exhibits a maximum in unitary regime. We calculate the condensate fraction and sound velocity across resonance. The transition from polaron condensate to molecular Fermi gas is also discussed.

Zeng-Qiang Yu
Institute for Advanced Study, Tsinghua University, Beijing, 100084, China

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