

Abstract Submitted
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Phase slip in a superfluid Fermi gas near a Feshbach resonance¹

LAN YIN, Peking University, PING AO, University of Washington — The properties of a phase slip in a superfluid Fermi gas is studied near a Feshbach resonance. The phase slip can be generated by the phase imprinting method. Below the superfluid transition temperature, it appears as a dip in the density profile, and becomes more pronounced when the temperature is lowered. Therefore the phase slip can provide a direct evidence of the superfluid state. The condensation energy of the superfluid state can be extracted from the density profile of the phase slip, due to the unitary properties of the Fermi gas near the resonance. The width of the phase slip is proportional to the inverse of the square root of the difference between the transition temperature and the temperature. The signature of the phase slip in the density profile becomes more robust across the BCS-BEC crossover.

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