

Abstract Submitted
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Evaporative Cooling of an Imbalanced Fermi Gas¹ YEAN-AN LIAO, GUTHRIE B. PARTRIDGE, WENHUI LI, RAMSEY I. KAMAR, DUONG NGUYEN, RANDALL G. HULET, Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77251 — We investigate the evaporative cooling of a two-component mixture of an optically trapped atomic Fermi gas to degeneracy using the semiclassical Boltzmann equation and Fermi statistics. The initial numbers of the two Fermi species are chosen to be unequal to simulate our recent experiment on pairing and phase separation of a gas of polarized ${}^6\text{Li}$ atoms.² We find that the cooling efficiency is reduced at high number polarization due to the lack of efficient collisions, in agreement with our experimental observations. We also explore the quantum effect of Pauli blocking near Fermi degeneracy which might affect the evaporative cooling process and the final number polarization.

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²G. B. Partridge *et al.*, *Science* **311**, 503 (2006).

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