

Abstract Submitted
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Polaron Thermodynamics of Spin-Imbalanced Quasi-Two-Dimensional Fermi Gases¹ WILLIE ONG, CHINGYUN CHENG, Duke University, North Carolina State University, ILYA ARAKELYAN, JOHN THOMAS, North Carolina State University — We present the first spatial profile measurements for spin-imbalanced mixtures of atomic ⁶Li fermions in a quasi-2D geometry with tunable strong interactions. The observed minority and majority profiles are not correctly predicted by BCS theory for a true 2D system, but are reasonably well fit by a 2D-polaron model of the free energy. Density difference profiles reveal a flat center with two peaks at the edges, consistent with a fully paired core of the corresponding 2D density profiles. These features are more prominent for higher interaction strengths. Not predicted by the polaron model is an observed transition from a spin-imbalanced normal fluid phase to a spin-balanced central core above a critical imbalance.

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