Abstract Submitted
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Evaporative Depolarization and Deformation of 3D Imbalanced Fermi Gases[1] Y.A. LIAO, A.S. RITTNER, M. REVELLE, R.G. HULET, Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77005 — We previously observed phase separation of a spin-imbalanced 3D Fermi gas, with a spatially deformed paired core surrounded by a shell of polarized atoms.[2] By studying the dynamics of evaporation, we find that trap depth anisotropy and fast evaporation produces the deformation. The deformed state is remarkably metastable, with a superfluid-normal transition which is extended to a much higher polarization than observed in the MIT and ENS experiments.[3] Our findings confirm the evaporative depolarization mechanism suggested previously,[4] in which preferential evaporation from the center of an elongated trap reduces the chemical potential difference in the central core relative to the surrounding polarized phases.

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[2]G. B. Partridge *et al.*, *Science* **311**, 503 (2006); G. B. Partridge *et al.*, *PRL* **97**, 190407 (2006).
[3]M. Zwierlein *et al.*, *Science* **311**, 492 (2006); S. Nascimbène *et al.*, *PRL* **103**, 170402 (2009).
[4]M. M. Parish *et al.*, *PRA* **80**, 063605 (2009)

Yean-an Liao

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