

Abstract Submitted  
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**Anomalous expansion of attractively interacting Fermions in an optical lattice**<sup>1</sup> TAKUYA KITAGAWA, Department of Physics, Harvard University, Cambridge, Massachusetts 02138, USA, LUCIA HACKERMÜLLER, ULRICH SCHNEIDER, MARÍA MORENO-CARDONER, THORSTEN BEST, SEBASTIAN WILL, Institut für Physik, Johannes Gutenberg-Universität, Staudingerweg 7, D-55099 Mainz, Germany, EUGENE DEMLER, Department of Physics, Harvard University, Cambridge, Massachusetts 02138, USA, IMMANUEL BLOCH, BELÉN PAREDES, Institut für Physik, Johannes Gutenberg-Universität, Staudingerweg 7, D-55099 Mainz, Germany — We consider a two component Fermi mixture of ultracold atoms with attractive interactions in an optical lattice and in the presence of a parabolic potential. Using a high temperature expansion, we analyze the behavior of the system size when adiabatically increasing the interaction strength. We show that entropy conservation leads to an anomalous radius increase for large values of the interaction. We also find that the competition between entropy and the Hartree part of the attractive interaction makes the system reach a minimum size at a nonzero value of the interaction.

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