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**Strongly Interacting Homogeneous Fermi Gases** BISWAROOP MUKHERJEE, PARTH PATEL, ZHENJIE YAN, JULIAN STRUCK, MARTIN ZWIERLEIN, Massachusetts Inst of Tech-MIT — We present a homogeneous box potential for strongly interacting Fermi gases. The local density approximation (LDA) allows measurements on traditional inhomogeneous traps to observe a continuous distribution of Fermi gases in a single shot, but also suffer from a broadened response due to line-of-sight averaging over varying densities. We trap ultracold Fermionic ($^6$Li) in an optical homogeneous potential and characterize its flatness through in-situ tomography. A hybrid approach combining a cylindrical optical potential with a harmonic magnetic trap allows us to exploit the LDA and measure local RF spectra without requiring significant image reconstruction. We extract various quantities from the RF spectra such as the Tan's contact, and discuss further measurements of homogeneous Fermi systems under spin imbalance and finite temperature.

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