

Abstract Submitted  
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**A new apparatus for studying non-equilibrium phenomena of dimensional crossover in quantum gases**<sup>1</sup> WEN XU, LEONARDO DE MELO, JIAMING LI, JI LIU, LE LUO, Department of Physics, Indiana University-Purdue University Indianapolis, Indianapolis IN 46202 — We describe the design of a new apparatus targeted at the study of non-equilibrium phenomena of the crossover between 2D and 3D using resonant Fermi gases. Specifically this apparatus will allow for a fast transformation between 2D and 3D optical dipole traps as well as a fast precise magnetic field sweep for the purpose of generating non-equilibrium many-body quantum states in the dimensional crossover regime. In addition we design a high resolution imaging system comprised of phase Fresnel lens and recessed UHV windows for studying the spatial structure of the non-equilibrium system. We will also analyze possible experimental routes for creating non-equilibrium states in resonant systems including both magnetic and optical methods.

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