

Abstract Submitted
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Towards measuring the transport properties of quantum mixtures in 1D rings YANPING CAI, KEVIN WRIGHT, Dartmouth — We are constructing a new ultra-cold ${}^6\text{Li}$ - ${}^7\text{Li}$ experiment optimized for studying interacting quantum mixtures both in low dimensions and in multiply-connected geometries. Starting from a dual-species 2DMOT for ${}^6\text{Li}$ and ${}^7\text{Li}$, we will capture and cool both species to degeneracy and load them (independently or as a mixture) into precisely engineered optical dipole traps. We have developed techniques for trapping atoms in configurations (e.g. rotating 1D ring lattices) where unusual quantum phases have been predicted to appear. We plan to make detailed measurements of the anomalous mass and spin transport properties that are the key signatures of some of these quantum phases.

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