

TRANSPORT OF 1D BOSE GASES IN OPTICAL LATTICES

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I will discuss experiments conducted at NIST which probe transport in a quantum degenerate quasi-1D atomic Bose gas. We produce our system by using optical lattices to trap and manipulate a BEC: one optical lattice partitions the condensate into an array of independent quasi-1D gases while another impresses a corrugating potential along the axial direction. By exciting axial dipole oscillations and observing their subsequent evolution, we observe a dramatic loss of transport as a function of increased corrugating lattice depth. We show that the corrugating lattice does not cause such an effect in a 3D Bose gas. A discussion of the experiment will be given, as well as an introduction to some recent theoretical work from various groups which posit explanations for our observations.