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# Ultracold atoms in strong disorder: A direct measurement of the Anderson transition

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## Abstract

The study of disordered systems with ultracold atoms has attracted much attention over the past decade, particularly to investigate the Anderson transition that occurs in three-dimensional systems between localized and diffusive states. However, significant discrepancies have been reported between experiments and numerics about the precise location of the mobility edge (energy of the transition), rendering new investigations desirable.

In this poster session, we will present recent progress along that line, including measuring the spectral functions in laser speckle disordered potential, the configuration of double speckles, and the controlled spectroscopic transfer of atoms to create well-defined energy states. By scanning the energy across the mobility edge, this method enables precise measurement and direct observation of the 3D Anderson transition, which enhances our understanding of the critical regime. Recent measurement applying this method has shown an apparent signature of transition at the expected mobility edge.

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