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Transport properties across the many body localization transition in quasiperiodic and random systems F. SETIWAN, University of Chicago, DONG-LING DENG, University of Maryland, JED PIXLEY, Rutgers University — We will present our comparative study of non-equilibrium dynamical transport properties across the many-body localization (MBL) transition in quasiperiodic and random models. Using exact diagonalization we compute the optical conductivity and the return probability and study their average low-frequency and long-time power-law behavior, respectively. We find that the low-energy transport dynamics is markedly distinct in both the thermal and MBL phases in quasiperiodic and random models and find that the diffusive and MBL regimes of the quasiperiodic model are more robust than those in the random system. We analyze the distributions of the DC conductivity and test the activated dynamical scaling ansatz in both models. We argue that near the MBL transition in quasiperiodic systems, critical eigenstates give rise to a subdiffusive crossover regime on finite-size systems.

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