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Dynamics at the Many-Body Localization Transition[1] LEA SANTOS, Yeshiva Univ, JONATHAN TORRES-HERRERA, Universidad Autonoma de Puebla — Studies about localization in interacting systems have recently boomed. The interest in the subject is motivated by indications of the existence of a many-body localization (MBL) phase and by advances in experiments with optical lattices, which may serve as testbeds for corroborating theoretical predictions. A paradigmatic system for these analysis is the one-dimensional isolated Heisenberg model with random magnetic fields. We study the dynamics of this system for initial states prepared with high energies. Our focus is on the probability for finding the initial state later in time, the so-called survival probability. Two distinct behaviors are identified before the saturation of the relaxation process. At short times, the decay is very fast, as typical of clean systems. It subsequently slows down and develops a powerlaw behavior with an exponent related with the multifractal structure of the eigenstates. The curve of the powerlaw exponent versus the disorder strength exhibits an inflection point that is associated with the metal-insulator transition point.

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