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Propagation of wave pakets in 1d spin systems - ballistic, diffusive, many-body localized? CHRISTOPH KARRASCH, UC Berkeley, FABIAN HEIDRICH-MEISNER, LMU Muenchen, JENS BARDARSON, FRANK POLLMANN, MPIPKS Dresden, JOEL MOORE, UC Berkeley — We study the propagation of local spin wave pakets in one-dimensional XXZ spin chains in presence of disorder. We employ a time-dependent finite-temperature density matrix renormalization group algorithm. For clean chains, the spin density spreads ballistically in the Luttinger liquid phase and diffusively in the gapped phase. We investigate the interplay of interactions and disorder and discuss how (and if) metallic and many-body localized phases manifest in this setup.

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