Equilibration properties of a disordered interacting open quantum system EVERT VAN NIEUWENBURG, SEBASTIAN HUBER, ETH - Hoenggerberg — The central question in the field of many body localization is if a closed interacting quantum system effectively thermalizes in the presence of disorder. However, any experimental test necessarily involves the opening of the ideally closed quantum system. Both from a fundamental point of view as well as for concrete experimental investigations of many body localization phenomena, a solid understanding of the effect of an attached bath is of significant importance. We study the equilibration properties of disordered interacting open quantum systems. On the one hand we consider the equilibration of such a many body localized system by coupling baths to the ends of a 1D spin chain. We find non-monotonous behaviour of the slowest relaxation time towards equilibrium. On the other hand, we take the bath itself to be a disordered interacting open quantum system and investigate the dephasing of a single qubit coupled to it. The model for the bath has a many body localization transition, affecting the dephasing of the single qubit.

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