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**Using subadditivity to reason about many-body localization on single disorder realizations.** BRYAN CLARK, XIONGJIE YU, DAVID J. LUITZ, University of Illinois at Urbana Champaign — In the many-body localized (MBL) phase, the interplay of interactions and disorder prevents thermalization. Typically to reason about the many-body localized phase we average over many disorder realizations. It is interesting to ask in what ways we can we talk about MBL transitions for single disorder patterns. We show that subadditivity gives us a mechanism to make sense of MBL transitions on single disorder realizations and report what this implies for the average over disorder.

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