

Abstract Submitted
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Probing quantum dynamics of strongly interacting spin ensembles GEORG KUCSKO, PETER MAURER, JOONHEE CHOI, NORMAN YAO, SOONWON CHOI, MICHAEL KNAP, SARANG GOPALAKRISHNAN, MIKHAIL LUKIN, Harvard Univ, HARVARD UNIV TEAM — Ensembles of strongly interacting spins offer an attractive platform for the study of many-body quantum dynamics. We present detailed study of the electronic spin dynamics within a diamond sample with very high nitrogen vacancy (NV) concentration (~80 ppm). Due to the small distance between neighboring NV centers, the spin-spin interactions dominate over decoherence. Furthermore, by utilizing dynamical decoupling techniques, it is possible to suppress decoherence and study many-body phenomena. In particular, we present investigation of the interplay between interactions and disorder in such a system.

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