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Progress Towards Quantum Networks Using Nitrogen Vacancy Center in Diamond EMRE TOGAN, YIWEN CHU, ALEXEI TRIFONOV, Harvard University, M.V. GURUDEV DUTT, University of Pittsburgh, LIANG JIANG, Harvard University, LILY CHILDRESS, Bates College, ALEXANDER ZIBROV, Harvard University, PHILIP HEMMER, Texas A&M, MIKHAIL LUKIN, Harvard University — Nitrogen Vacancy (NV) centers are promising systems for the realization of quantum registers in scalable quantum networks. A key ingredient of such a network is the entanglement between photons and the spins of individual NV centers that can be used to generate entanglement between separate NV based registers. We describe recent progress toward demonstrating spin-photon time-bin entanglement with the NV and evaluate the feasibility of using this scheme to entangle many NV centers.

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