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Room temperature entanglement of two NV centres

Designing a scalable qubit array is one of the major challenges in quantum information processing applications.
Here the nitrogen vacancy center is an outstanding system because it allows for single qubit control and ms coherence time at room temperature and to coherently couple to spins a few tens of nm away. Coherent interaction can be used to relay information and create quantum mechanical states between two remote entities i.e. an non-local state. There are multiple schemes for implementing a scalable qubit array i.e. using dark spins as spin bus to transport information between NV centers [1]. Also the direct dipolar inter action between NV centers is suitable to relay information from one NV to another. A first NV array was implemented by Neumann et al but lacked the coherence times for coherent interaction [2].

[1] Yao N.Y. et al. NATURE COMMUNICATIONS 3,800 (2012)
[2] Neumann P. et al. NATURE PHYSICS 6,249 (2010)