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Fabrication of Diamond for Low Temperature Experiments WEN-QIAN LIAN, LI HE, XIN WANG, XINXING YUAN, HUILI ZHANG, CHUHENG ZHANG, XIUYING CHANG, PANYU HOU, WENGANG ZHANG, XIAOLONG OUYANG, XIANZHI HUANG, LUMING DUAN, Tsinghua Univ — The nitrogen-vacancy (NV) center in diamond is a promising physical implementation of quantum computing. At low temperature (about 4K), NV center shows a lot of advantages comparing with room temperature. The coherence time of electron spin in NV center is about 10 ms. Besides, the electron spin state read out efficiency is increased by single shot read out scheme. Most importantly, the electron spin can be resonantly driven, so remote NV centers can be entangled by the interference of the resonant zero phonon line photons, which is a promising scheme for the realization of quantum computer based on NV center. Here we show the fabrication work on diamond and the basic test at the low temperature toward quantum network based on NV center.

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