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Decoherence of nitrogen-vacancy center spins in diamond and its control SAI WAH HO, JIAN LIANG HU, NAN ZHAO, REN BAO LIU, The Chinese University of Hong Kong — We theoretically investigated the pure dephasing of NV spins in diamond coupled to carbon-13 spin baths with dipolar intra-bath interaction, using a many-body quantum theory [1]. Moreover, we study the control of decoherence with the Uhrig dynamical decoupling [2]. Under zero external magnetic field, the calculated free-induction decay time is about 1μs, and a 5- pulse Uhrig sequence brings the coherence time to above 250 μs. Under a strong magnetic field (5300 G), the free- induction decay time is about 2μs, and the coherence time under the 5-pulse Uhrig control is above 2.5 ms. This work was supported by Hong Kong GRF Project CUHK401906 and CUHK402209. References: 1. W. Yang and R. B. Liu, Phys. Rev. B 78, 085315 (2008); ibid 79, 115320 (2009). 2. G. S. Uhrig, Phys. Rev. Lett. 98, 100504 (2007).

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