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Perfect selective orientation of nitrogen vacancy centers in diamond TAKAHIRO FUKUI, YUKI DOI, Osaka University, TAKEHIDE MIYAZAKI, YOSHIYUKI MIYAMOTO, AIST, HIROMITSU KATO, TSUBASA MATSUMOTO, TOSHIHARU MAKINO, SATOSHI YAMASAKI, AIST, CREST, RYUSUKE MORIMOTO, NORIO TOKUDA, Kanazawa University, MUTSUKO HATANO, Tokyo Institute of Technology, CREST, YUKI SAKAGAWA, Osaka University, HIROKI MORISHITA, TOSHIYUKI TASHIMA, SHINJI MIWA, YOSHISHIGE SUZUKI, NORIKAZU MIZUOCHI, Osaka University, CREST, OSAKA UNIVERSITY TEAM, AIST TEAM, CREST TEAM, KANAZAWA UNIVERSITY TEAM, TOKYO INSTITUTE OF TECHNOLOGY TEAM — Nitrogen-vacancy centers in diamond are equally aligned along one of four axes. The precise control of the NV axis is significant for enhancement of a magnetic-field sensitivity. We investigated the alignment of NV centers in a (111)-CVD diamond by optically detected magnetic resonance. more than 99 % of the NV centers is aligned along the [111]-axis [1]. Simulation results using first-principles energetics also demonstrate that the preferential alignment is caused by the nitrogen-atom lone-pair in the [111] direction [2]. We show preliminary results of the preferential alignment of NV centers made by an ion-implantation. Note that other groups reported such an alignment of NV centers [3]. we acknowledge financial support by SCOPE, JST-CREST, KAKENHI, and NICT programs. [1] T. Fukui, et al., Appl. Phys. Express **7**, 121202 (2014). [2] T. Miyazaki, T. Fukui, et al., arXiv: 1409. 2573 (2014). [3] J. Michl, et al., Appl. Phys. Lett. **104**, 102407 (2014); M. Lesik, et al., Appl. Phys. Lett. **104**, 113107 (2014).

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