Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Investigation of spin drift velocity and the modulation of spin signals under spin drift in highly-doped n-type Si MAKOTO KAMENO, Osaka University, YUICHIRO ANDO, TERUYA SHINJO, MASASHI SHIRAISHI, Kyoto University, HAYATO KOIKE, TOMOYUKI SASAKI, TOHRU OIKAWA, TDK Corporation, TOSHIO SUZUKI, AIT, OSAKA UNIVERSITY TEAM, KYOTO UNIVERSITY COLLABORATION, TDK CORPORATION COLLABORATION, AIT COLLABORATION — Spin drift enables to modulate a spin transport length scale in semiconductor.[1] We have experimentally investigated a role of spin drift in spin transport in highly-doped n-Si, i.e., the modulation of a spin transport length scale by using an electrical spin transport method.[2] The results directly show that spin drift becomes prominent in spin transport in semiconductor. In addition, spin drift velocity in the highly-doped Si channel was quantitatively estimated by introducing a new experimental technique.[3] It was revealed that Hanle-type spin precession signals from the Si were modulated by spin drift and were theoretically reproduced.

[1]Z.G. Yu and M.E. Flatte, Phys. Rev. B 66, 201202(R) (2002).
[2]M. Kameno et al., Appl. Phys. Lett. 101, 122413 (2012).
[3]M. Kameno et al., Appl. Phys. Lett. 104, 092409 (2014).

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Date submitted: 13 Nov 2014 Electronic form version 1.4