

Magnetization-dependent inverse spin Hall effect at perpendicular magnetized Tb-Co/Pt interface

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Recently, it has been investigated that spin-orbit coupling at magnetic/nonmagnetic interface induce a spin-to-charge current conversion with different symmetry from the conventional inverse spin Hall effect (c-ISHE) [1,2]. Here, the orientation of spin current polarization can be manipulated by the direction of perpendicular magnetized material (figure) [3]. In this study, we investigate the magnetization-dependent inverse spin Hall effect (md-ISHE) in SiN(10 nm cap)/Tb_xCo_{100-x}(19 nm)/Pt(1 nm)/YIG(167 nm)/SiO₂ (substrate) devices due to spin Seebeck effect. We clearly observe voltage signals due to the c-ISHE and md-ISHE in our devices, which the md-ISHE polarity depends on the magnetization direction of spin converter layer. Moreover, the magnitude of induced charge current due to md-ISHE is observed to be almost insensitive for all Tb_xCo_{100-x} samples, whereas the c-ISHE significantly depends on the composition ratio.

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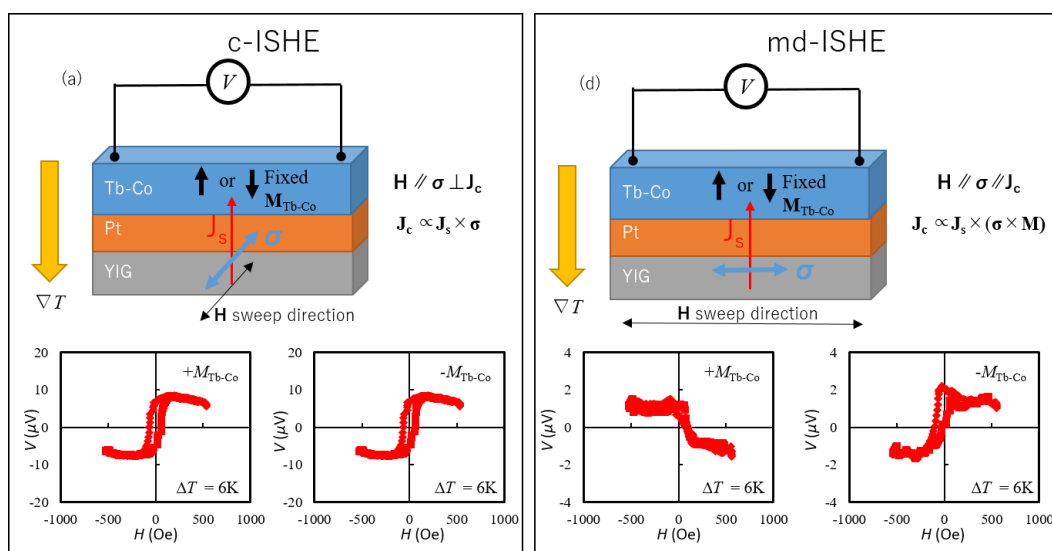


Figure (a) Schematic illustrations and results of (a) c-ISHE and (b) md-ISHE.

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