

Abstract Submitted
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Control of Spin Injection by DC Current in Transparent Lateral Spin Valves¹ AMOS SHARONI, FELIX CASANOVA, MIKHAIL EREKHINSKY, IVAN K. SCHULLER, UC San Diego — Lateral spin valves can be classified according to the type of interfaces (tunnel or transparent) between the ferromagnetic electrodes and the normal material. The tunnel barrier yields a large spin signal, but the maximum spin-polarized current was reported to decrease strongly with applied bias. In transparent interfaces the maximum current density through the interface is much larger, which is beneficiary for some applications, but the effect on spin signal was not measured. To address this issue, we prepared metallic lateral spin valves with excellent transparent interfaces. In addition, instead of AC lock-in techniques commonly used to measure these devices, we perform DC measurements, which enables us to measure directly the effects of the current direction and magnitude on the spin signal. We compared the injection of majority spins from the ferromagnet into a non-magnetic metal (NM) with the reversed process where minority carriers are left in the NM. We were also able to study the effect of joule heating and identified the origin of voltage backgrounds usually observed in these devices.

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