Abstract Submitted
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Magnetic-field-assisted spin-transfer switching in nonlocal spin valves[1] HAN ZOU, XIAOJUN WANG, YI JI, University of Delaware — Nonlocal spin valve (NLSV) is a spin injection and detection device consisting of a nonmagnetic metal N connected to ferromagnetic spin injector F_1 and detector F_2. We fabricate NLSV devices, using 100 nm thick Cu as N, 10 – 20 nm thick Co as F_1, and 3 nm thick Co as F_2. The widths of the Cu and Co wires are $\sim$ 150 nm. To ensure the electrical continuity of the F_2 electrode, a 5 nm thick Cu layer is placed underneath. The center-to-center separations between F_1 and F_2 are 200 - 350 nm. The nonlocal spin signals at 4.2 K are 2 - 4 milliohms. The spin-transfer switching has been achieved with the assistance of a magnetic field. The F_1 and F_2 electrodes are set in an anti-parallel configuration, and the magnetic field is set to a value smaller but close to the switching field of F_2. A d.c. current pulse with appropriate polarity is injected through F_1 to induce the spin-transfer. A small d.c. current ($<$ 0.5 mA) is sufficient to switch F_2 into being parallel with F_1. Analysis has been done to rule out possible artifacts due to Oersted fields.

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