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Spin-Flipping at Co/Ni Interfaces[1] HOANG YEN THI NGUYEN, RAKHI ACHARYYA, ERIC HUEY, BRANDON RICHARD, REZA LOLOEE, WILLIAM P. PRATT JR., JACK BASS, Physics Dept., Michigan State University, East Lansing, MI — One of the few fundamental questions about electron-spin propagation across metal interfaces involving a ferromagnet (F) that is not yet answered is: 'What is the probability (P) of spin-flipping across such interfaces?' We describe a technique for measuring the parameter δ [P = 1 - exp(-δ)] for interfaces with one or two F-metals, in the current-perpendicular-to-plane (CPP) geometry, and apply it to Co/Ni interfaces. For Co/Ni, the technique involves combining measurements of sputtered simple $[Co(3nm)/Ni(3nm)]_n$ multilayers (n = number of repeats) with those on sputtered Permalloy (Py = Ni(1-x)Fe(x) with x $\sim$ 0.2) based double spin-valves with symmetric Py layers, containing $[Co(3nm)/Ni(3nm)]_n$ multilayer inserts in the middle of the 20 nm thick central Cu layer. In the spin-valves, the Py layer magnetizations are pinned by adjacent FeMn layers, so that an external magnetic field H can switch the ferromagnetically coupled $[Co/Ni]_n$ multilayer from parallel (P) to anti-parallel (AP) to the pinned Py layers. From CPP-MR measurements at 4.2K, we determine the Co/Ni interface resistance and spin-scattering asymmetry, and estimate δ(Co/Ni) $\sim$ 0.3.

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