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**Theory of spin relaxation at metallic interfaces**[1] K. D. BELASHCHENKO, ALEXEY A. KOVALEV, University of Nebraska-Lincoln, MARK VAN SCHILFGAARDE, King's College London — Spin-flip scattering at metallic interfaces affects transport phenomena in nanostructures, such as magnetoresistance, spin injection, spin pumping, and spin torques. It has been characterized for many material combinations by an empirical parameter $\delta$, which is obtained by matching magnetoresistance data for multilayers to the Valet-Fert model [J. Bass and W. P. Pratt, J. Phys.: Condens. Matter **19**, 183201 (2007)]. However, the relation of the parameter $\delta$ to the scattering properties of the interface remains unclear. Here we establish this relation using the scattering theory approach and confirm it using a generalization of the magnetoelectronic circuit theory, which includes interfacial spin relaxation. The results of first-principles calculations of spin-flip scattering at the Cu/Pd and Cu/Pt interfaces are found to be in reasonable agreement with experimental data.

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