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Including spin-orbit coupling in materials-specific studies of spin transport. A.A. STARIKOV, P.J. KELLY, University of Twente — Spin-orbit coupling (SOC) plays a crucial role in magnetoelectronics: it is the origin of anisotropic magneto-resistance (AMR), prevents half-metallic ferromagnets from having 100% spin polarization, gives rise to spin-flip scattering which ultimately destroys the spin polarization of a current in non-magnetic materials - to mention but a few of its effects. Nevertheless, it has been virtually ignored in theoretical transport studies. To redress this neglect, we have developed a method based upon Linearized Muffin-Tin-Orbitals suitable for studying spin-dependent transport in nanostructures which includes SOC and provides a framework for modelling layered magnetic systems with non-collinear magnetizations. As a first application and test of the method, we study the AMR effect in ferromagnetic alloys.

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