Spin polarized transport form first principles. From magnetic multilayers to graphene.

Maciej Zwierzycki
Institute of Molecular Physics P.A.S, Smoluchowskiego 17, 60-179 Poznań, Poland

The flow of charge and spin currents in nanostructures can be conveniently related to their scattering properties expressed in terms of transmission and reflection coefficients. Wave function matching (WFM) is a transparent technique for calculating these quantities. In this talk we give an overview of first-principles implementation of WFM which is *i)* capable of taking into account complex electronic structures of magnetic transition metals commonly found in magnetoelectronic devices and *ii)* efficient so that disorder can be modeled using large lateral supercells. Additionally we discuss number of applications to systems ranging from metallic multilayers to graphene junctions. We concentrate on the analysis interface of scattering and the interplay between the effects related to the electronic structure mismatch and the disorder.

9.7 cm

13.4 cm

Subject category :
4. Spin Electronics and Magneto-Transport

Presentation mode :
oral

Corresponding author :
Maciej Zwierzycki

Address for correspondence :
Institute of Molecular Physics P.A.S, Smoluchowskiego 17, 60-179 Poznań, Poland

Email address :
Maciej.Zwierzycki@ifmpan.poznan.pl