Spin Current Experiments

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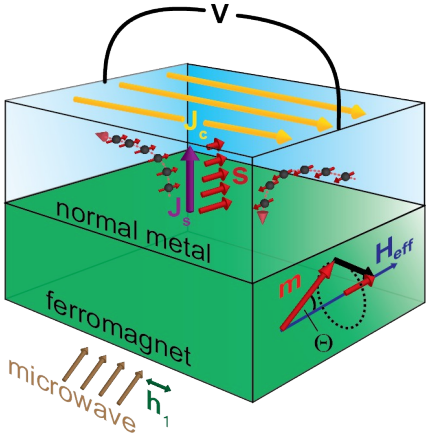
A pure spin current – i.e., the directed flow of spin angular momentum – is a fascinating manifestation of spin physics in the solid state. In ferromagnet/normal metal thin film heterostructures, pure spin currents can be generated, e.g., by means of spin pumping [1,2], or via the application of thermal gradients in the so-called spin Seebeck effect [3,4]. An elegant scheme for detecting spin currents relies on the inverse spin Hall effect: Because of spin-orbit coupling, a spin current also induces a charge current, which then can be detected using conventional electronics [1-4]. Furthermore, the interplay between charge and spin currents gives rise to an interesting magnetoresistance effect in magnetic insulator/normal metal heterostructures, the so-called spin Hall magnetoresistance (SMR) effect [5,7].

In the talk, I will give an overview over our recent experiments on spin current transport in ferromagnet/normal metal hybrid devices [4-7]. After an introduction to pure spin current transport and spin Hall physics, I will in particular address spin pumping experiments, and discuss spin Hall magnetoresistance measurements in different materials and in nano-structures.



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