

POZVÁNKA

na seminář oddělení 15 Fyzikálního ústavu AV ČR, v.v.i.

Seminář se koná

ve čtvrtek 25. února 2010 v 10:00

v zasedací místnosti budovy A (1. patro vedle knihovny)
Fyzikálního ústavu, Cukrovarnická 10, Praha 6.

Na programu je přednáška

Spin pumping in magnetic tunnel junctions and topological insulators: Theory and experiments

kterou prosloví

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Abstrakt

The pursuit of the second-generation spintronics has been focused on harnessing coherent spin states and their dynamics in metals and semiconductors. The salient examples of phenomena involving both coherent spins and their time evolution is the spin-transfer torque and its reciprocal effect, termed spin pumping because it occurs in the absence on any bias voltage, where microwave driven precessing magnetization of a single ferromagnetic (FM) layer emits pure spin current into adjacent normal metal (N) layers. While it has been long considered that low transparent interfaces would completely screen the interfacial spin pumping effect, the recent surprising measurements of large voltage signals of the order of $1 \mu\text{V}$ in microwave driven FM/I/N and FM/I/FM tunnel junctions have attracted considerable attention. In this talk, I review these experimental results together with the nonequilibrium Green function (NEGF) approach to spin pumping we developed to explain the surprisingly large pumping voltage. In addition, this approach allows us to examine spin pumping into chiral spin-filtered edge states of recently discovered two-dimensional topological insulators, which can either substantially enhance the pumped pure spin current or convert it into transverse charge current as the electrically measurable signature of the inverse quantum spin Hall effect and topological phases of matter.