



学术报告

Title: Spin transport driven by spin-vorticity coupling

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Abstract

Spin current is a key concept in spintronics. Spin-current generation has been achieved by using angular momentum conversion among magnetization, photons, the orbital motion of electrons, and spin angular momentum. Recently, the interconversion between mechanical angular momentum in moving objects and spin has attracted much attention.

In this talk, I will present our recent results on spin-current generation via spin-vorticity coupling in (a) moving materials and (b) non-uniform materials.

(a) In moving objects, spin-vorticity coupling emerges and enables the conversation from mechanical angular momentum into spins. Such mechanical generation of spin current is predicted in rigid, elastic, and fluid materials [1,2,3] and all of these are experimentally demonstrated [4,5,6].

(b) In non-uniform materials, vorticity of the electric current originating from a gradient in the electrical mobility couples to electron spins. This coupling is demonstrated in surface-oxidized copper films [7].

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