529th ASRC Seminar

Date: 13:30 ～15:00, 9 September

Location: Meeting room 302, ASRC Building

Speaker: Prof. Jiang Xiao
(Fudan University)

Title: Current-induced spin wave excitation in Pt|YIG bilayer

We develop a self-consistent theory for current-induced spin wave excitations in normal metal|magnetic insulator bilayer structures.
We compute the spin wave dispersion and dissipation, including dipolar and exchange interactions in the magnet, the spin diffusion in the normal metal, as well as the surface anisotropy, spin-transfer torque, and spin pumping at the interface. We find that: 1) the spin transfer torque and spin pumping affect the surface modes more than the bulk modes; 2) spin pumping inhibits high frequency spin-wave modes, thereby red-shifting the excitation spectrum; 3) easy-axis surface anisotropy induces a new type of surface spin wave, which reduces the excitation threshold current and greatly enhances the excitation power. We propose that the magnetic insulator surface can be engineered to create spin wave circuits utilizing surface spin wave as information carrier.

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