北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Energy Harvesting by Spin Current

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Time: 4:00Pm, March. 28, 2019 (Thurseday)

时间：2019年3月28日 （周四）下午16:00

Venue: Room W563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

The flow of electron spins, the so-called "spin current", is a key concept in the recent progress in spintronics [1,2]. In a ferromagnet, the spin current interacts with magnetization by the exchange interaction and induces the motion of the magnetization due to the angular momentum conservation, the so-called spin transfer torque. Its inverse effect is called the spin-motive force which is the electric voltage generated by the magnetization dynamics due to the energy conservation between electrical current and magnetization [3]. The spin motive-force is derived by extending the Faraday's law of electro-magnetism.

Spin current is induced and manipulated by heat [4] and mechanical motion [5,6] as well. The interconversion between various energies through spin current , the so-called "power spintronics",is discussed.

[1] "*Concepts in Spin-Electronics*" ed. S.Maekawa (Oxford Univeristy Press, 2006),
[2] "S*pin Current*" eds. S.Maekawa, et al. (Oxford University Press, 2012 and 2017),
[3] S.E.Barnes and S.Maekawa,: Phys. Rev. Lett. **98**, 246601 (2007),
[4] K.Uchida et al: IEEE proc. **104**, 1946 (2016),
[5] R.Takahashi et al.: Nature Phys. **12**, 52 (2016),
[6] R.Takahashi, et al.: to be published (2018).

About the speaker

Professor Meakawa's main research interest is in the theory of electronic properties in strongly correlated electron systems and transport in magnetic nanostructures. He has won many distinguished honors and awards, including Honoris Causa Doctorate of University of Zaragoza (2013), IUPAP Magnetism Award and Néel Medal (2012), APS Fellow (2007), Magnetics Society of Japan Award (2003), Humboldt Award (2001), IOP Fellow (1999).