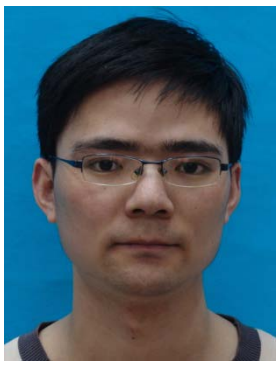
Seminar

The novel applications of spin Hall effect



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Time: 4:00pm, Dec. 19, 2013 (Thursday)
时间： 2013年12月19日（周四）下午4:00
Venue: Room 607, Science Building 5
地点： 理科五号楼607会议室

Abstract

Spin Hall effect (SHE) plays key role in spintronic applications as it allows the conversion between charge- and spin- currents. Recent years the SHE has been intensively studied mainly in two types of devices: non-loclal spin valve and ferromagnet-normal metal junction. Here we demonstrate two novel applications of SHE in these devices. First, we show that the inverse SHE can be used as an ultra-high-sensitive probe of nonlinear spin fluctuation in weak ferromagnet near their Curie temperatures. By extending Kondo's model for the anomalous Hall effect, the observed anomaly in SHE can be nicely explained as originating from the second-order nonlinear spin fluctuation of magnetic moments. Secondly, we successfully utilized the ac-SHE to directly detect the dynamic spin current in spin pumping, which is one order of magnitude larger than the conventional dc-one measured on the same FM-NM junction. Our results demonstrate a novel approach to improving the overall efficiency in the GHz frequency range without requiring special materials for giant spin Hall angles.

About the Speaker

Dahai Wei obtained his B.S. in Physics from Nanjing University in 2004, and Ph.D. in Physics from Fudan University in 2009. He then worked as a post-doc in the nano-magnetism group at Institute of Solid State Physics, Tokyo University, Japan. In 2012 he continued to work in Regensburg University, Germany, and later as a Humboldt researcher supported by Alexander von Humboldt foundation, Germany. His research has been focused on the experimental spintronics, including spin Hall effect, spin pumping and variety of behaviors induced by spin current.