Department of Physics
Faculty of Mathematics and Natural Sciences
Universitas Indonesia

WEEKLY SEMINAR

DYNAMICS OF A MAGNETIC MOMENT IN AN ELECTRON GAS

Educational Background:

- Doctor of Science in Physics, Tohoku University, Sendai, Japan (2018)
- Master of Science in Physics, Tohoku University, Sendai, Japan (2014)
- Bachelor of Science in Physics, Tohoku University, Sendai, Japan (2012)

Publications:

- A. O. Leon, A. B. Cahaya, and G. E. W. Bauer, *Phys. Rev. Lett.* **120**, 027201 (2018)
- A. B. Cahaya, A. O. Leon, and G. E. W. Bauer, *Phys. Rev. B* **96**, 144434 (2017)
- A. B. Cahaya, O. A. Tretiakov, and G. E. W. Bauer, *IEEE Trans. Magn.* **51**, 0800414 (2015)
- A. B. Cahaya, O. A. Tretiakov, and G. E. W. Bauer, *Appl. Phys. Lett.* **104**, 042402 (2014)

Awards:

- Japan Society for the Promotion of Science (JSPS) Fellowship for Young Scientists (2015-2018)
- Japanese Ministry of Education and Sport (MEXT) Scholarship (2008-2014)
- Young Scientist Award from Aoba Society for the Promotion of Science (2012)

Abstract

Spintronics is the science and technology that study spin in addition to electron charge as in conventional electronics. The manipulation of magnetic moment is one of the main focuses of spintronics. Recent development of spintronics took great interest in the manipulation of magnetic moments by spin current and vice versa. It leads to the discovery of spin pumping effect, pure spin current generation do to the electron's spin dependent scattering. The scattering can be induced by the exchange interaction between the magnetic moment and the spin of adjacent normal metal's electron This lecture discuss the dynamics of a magnetic moment in an electron gas, which is the simplest model of a metal's conduction electron. The magnetization induces a dynamic spin density (RKKY) oscillation via exchange interaction. Furthermore, the interaction between the magnetization and spin density generates a spin current emanating radially out from the magnetic moment. Since the spin current generation is not accompanied by electric currents, the spin pumping effect can also be induced by the magnetic moment of insulating magnetic layers. The dynamics of such magnetic structures is important for engineering of microstructure devices, such as magnetic recording and nanoscale thermoelectric generator.

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13.00 – 15.00 WIB

Main Seminar Room
Dept. of Physics, FMIPA UI
Depok

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Wednesday

May 2018

This seminar is open to the public (students, lecturers, researchers, etc.) and free of charge