

凝縮系物理学ゼミナール

Condensed Matter Seminar

Location: Room 413, School of Science Bldg. 5 (理学 5 号館 413 号室)
Time and date: 13:30 – 15:00, Wednesday, 17 April 2013

Study of f-electron superlattice

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Abstract:

Motivated by the recent realizations of the novel f-electron superlattices $\text{CeIn}_3/\text{LaIn}_3$ and $\text{CeCoIn}_5/\text{YbCoIn}_5$ [1,2,3], we theoretically study properties of the heavy electrons in superlattices. It is shown that, although the heavy electrons are formed at a single energy scale, transport properties show dimensional crossover from two to three dimensions. Furthermore, we examine magnetism and superconductivity in the superlattice. It is found that spin fluctuations are strongly suppressed, while the superconductivity is rather robust. In this talk, relations to the experimental observations are also discussed.

References:

- [1] H. Shishido *et al.*, Science **327**, 980 (2010).
- [2] Y. Mizukami *et al.*, Nat. Phys. **7**, 849 (2012).
- [3] S. K. Goh *et al.*, Phys. Rev. Lett. **109**, 157006 (2012).