凝縮系物理学ゼミナール
Condensed Matter Seminar

(※ seminar is held online via zoom)

Date: **<u>13:30-15:00</u>**, Wednesday, 23 December 2020

"Strong correlation effects on the nonlinear Hall effect in Weyl-Kondo semimetals"

Speaker:

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Abstract:

Recently it has become clear that a nonlinear Hall effect(NLH) can emerge even in a time-reversal symmetric system, which is closely connected with the topological nature of the material, namely the "Berry curvature dipole"[1]. This characteristic makes the NLH an alternative to studying the topology of the material, even when it is difficult to determine the band structure directly, e.g., in strongly correlated topological materials.

Recently, in Ce3Bi4Pd3, which is a promising candidate for a Weyl-Kondo semimetal(WKSM), a giant spontaneous Hall effect has been experimentally observed[2]. This experiment implies that strong correlations can enhance NLH. However, the relation between strong correlations and NLH is still poorly understood.

In this work, we focus on NLH in WKSM. Specifically, we analyze a periodic Anderson model corresponding to a WKSM using dynamical mean-field theory combined with the numerical renormalization group. We use an extension of the Kubo formula for nonlinear responses to calculate the NLH. We find that the temperature dependence of NLH in our calculation is consistent with the experiment, and we show that strong correlation effects can enhance NLH.

References:

[1] Inti Sodemann and Liang Fu, Phys, Rev, Lett. **115,** 216806 (2015).
[2] Dzsaber *et al.,* arXiv:1811.02819 (2018).