Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Ferri magnetic fluctuation in Molecular Dirac Fermion System $\alpha-(\mathrm{BEDT-TTF})_2\mathrm{I}_3$ GENKI MATSUNO, AKITO KOBAYASHI, Nagoya University — In an organic conductor α-(BEDT-TTF)$_2$I$_3$, a two-dimensional massless Dirac Fermion system is realized under pressure. Because the Dirac Fermion phase is next to the charge ordered phase observed under low pressures, it is expected that electron-electron interaction is relevant even in the Dirac Fermion phase. The sublattice-selective nuclear magnetic resonance measurement have revealed anomalous temperature dependence of the spin susceptibilities under pressure. Below 100K, all component of the Knight shift is heavily suppressed compared to the value expected in a non-interacting Dirac Fermion model. Furthermore, the first evidence of the ferrimagnetic polarization, negative magnetic responce on the B sublattice below 60K, is reported [1]. In this study, we examine the spin susceptibility with random phase approximation in a Hubbard model describing α-(BEDT-TTF)$_2$I$_3$. It is found that the ferrimagnetic fluctuation emerges only if there exist cross terms between intra- and inter-band irreducible susceptibilities in the presence of on-site Coulomb repulsion U, reflecting the characteristic phase structure of wave functions in the Dirac Fermion system with multi-sublattices. [1] M. Hirata et al., Nat. Commun. 7, 12666 (2016)

Genki Matsuno
Nagoya University

Date submitted: 11 Nov 2016 Electronic form version 1.4