Abstract Submitted
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Thermal-transport measurement in a gapless spin-liquid state of $EtMe_3Sb[Pd(dmit)_2]_2$ MINORU YAMASHITA, NORIHITO NAKATA, YOSHINORI SENSHU, TAKASADA SHIBAUCHI, YUJI MATSUDA, Department of Physics, Kyoto University, REIZO KATO, Riken — The quest of the ground state of quantum spins ($S = 1/2$) under a geometrical frustration such as triangular lattice and kagomé lattice has been attracting tremendous attention for several decades, because a novel quantum state of matter is expected to emerge. One promising method to unveil the ground state is to measure the thermal conductivity because it is very sensitive to delocalized low-lying quasiparticles. We report thermal conductivity (κ_{xx}) and thermal Hall conductivity (κ_{xy}) measurements of $EtMe_3Sb[Pd(dmit)_2]_2$ down to 100 mK. This organic insulator with nearly identical 2D triangular lattice of $S = 1/2$ has been reported to possess a novel spin liquid state down to $\sim J/12,000$ by NMR. We found a clear residual of κ/T in the zero- temperature limit, showing a contrasting behavior found in κ-$(BEDT\text{-}TTF)_2Cu_2(CN)_3$ in which a spin gap is formed below ~ 0.5 K [1]. This residual κ/T shows that there are gapless Fermionic excitations, such as spinons. We will discuss results of κ_{xy} up to 12 T in terms of recent theoretical suggestion of thermal Hall effects for spinons [2]. [1] M. Yamashita *et al.*, Nature Physics **5**, 44- 47 (2009). [2] H. Katsura *et al.*, arXiv:0904.3427

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