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Spin-state blockade in Te^{6+}-substituted electron-doped $LaCoO_3$[1]
KEISUKE TOMIYASU, SHUN-ICHI KOYAMA, MASANORI WATAHIKI, MIKA SATO, KAZUKI NISHIHARA, MITSUGI ONODERA, KAZUAKI IWASA, TSUTOMU NOJIMA, Tohoku Univ, YUUICHI YAMASAKI, HIRONORI NAKAO, YOUICHI MURAKAMI, KEK — Perovskite-type $LaCoO_3$ (Co^{3+}: d^6) is a rare inorganic material with sensitive and characteristic responses among low, intermediate, and high spin states. For example, in insulating nonmagnetic low-spin states below about 20 K, light hole doping (Ni substitution) induces much larger magnetization than expected; over net $10\mu_B$/hole ($5\mu_B$/Ni) for $1\mu_B$/hole ($1\mu_B$/Ni), in which the nearly isolated dopants locally change the surrounding Co low-spin states to magnetic ones and form spin molecules with larger total spin [1-4]. Further, the former is isotropic, whereas the latter exhibits characteristic anisotropy probably because of Jahn-Teller distortion [2]. In contrast, for electron doping, relatively insensitive spin-state responses were reported, as in $LaCo(Ti^{4+})O_3$, but are not clarified, and are somewhat controversial. Here, we present macroscopic measurement data of another electron-doped system $LaCo(Te^{6+})O_3$ and discuss the spin-state responses.
– Refs. [1] S. Yamaguchi et al., PRB (1996). [2] K. Tomiyasu et al., PRB (2013). [3] A. Podlesnyak et al., PRL (2008). [4] Y. Ju et al., J. Supercond. Nov. Magn. (2013).

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