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Nonreciprocal transport in superconducting MoS_2 YU SAITO, RYOHEI WAKATSUKI, Univ of Tokyo, SHINTARO HOSHINO, RIKEN, TOSHIYA IDEUE, MOTOHIKO EZAWA, Univ of Tokyo, NAOTO NAGAOSA, RIKEN, YOSHIHIRO IWASA, Univ of Tokyo — The breaking of the inversion symmetry causes variety of interesting phenomena, such as optical nonlinear response, shift current and multiferroics, in condensed matter physics. Nonreciprocal charge transport, i.e., nonlinear resistance depending on the direction of current, is one of the important phenomena which is expected in such systems. MoS_2, which is an archetypal layered semiconductor, can be a candidate material to investigate nonreciprocal phenomena because its monolayer, which possesses three-fold symmetry, shows out-of-plane spin polarization at the K-points due to intrinsic Zeeman-type spin-orbit coupling. Moreover, by ionic-liquid gating, almost all carriers are confined only to topmost layer, realizing 2D superconductivity without in-plane inversion symmetry [1]. In this talk, we report nonreciprocal charge transport in superconducting MoS_2. We observed the nonreciprocal signals in superconducting state enhanced compared to the normal state, which is the consistent with the theoretical prediction. [1] Y. Saito et al. Nature Phys. 12, 144 (2016).

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