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Nonequilibrium spin polarization induced charge Hall effect
DAZHI HOU, Z. QIU, WPI Advanced Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan, R. IGUCHI, Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan , K. SATO, WPI Advanced Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan, K. UCHIDA, G. W. BAUER, EIJI SAITOH, Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan — The nonequilibrium spin polarization lies at the heart of information processing in spin-based devices. The generation and manipulation of the spin polarization have been realized by various approaches, however, the spin polarization is usually considered to have negligible effect on the electric transport property, especially for systems of high electron concentration like metals ($\varepsilon_F \sim$ eV). Here we show that the nonequilibrium spin polarization can cause a novel Hall voltage in a conventional metallic alloy at room temperature, which is due to a new mechanism and closely related to the spin Nernst effect.

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