Spin-current induced dissipation in metals\textsuperscript{1} ASHWIN A. TULAPURKAR, Indian Institute of Technology, Mumbai, India, YOSHISHIGE SUZUKI, Osaka Univ., OSAKA UNIV. TEAM — By using the Boltzmann’s transport equations, we calculate the rate at which entropy is produced when spin-polarized current flows through a metal. A new pair of thermodynamic force and current is required to describe the entropy production. The dissipation, which is related to the entropy production, can be interpreted in terms of a simple circuit model which is also used to describe the giant magneto-resistance (GMR) effect. As an application of these results, we find that when current is passed through an interface between two oppositely magnetized ferromagnets, the extra dissipation produced due to the GMR effect is more localized than the variation of spin-dependent electrochemical potentials.

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