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Chiral Phonons and Electrical Resistivity of Ferromagnetic Metals at Low Temperatures[1] EDGARDO SOLANO CARRILLO, ANDREW J. MILLIS, Columbia University — In the presence of a magnetic field (produced for example by the exchange field of a ferromagnet) phonons become chiral, with left and right circularly polarized modes in addition to the longitudinal or zero-helicity mode. The scattering of spin-split electrons by chiral phonons is investigated, with particular attention to the question of whether the scattering can account for the linear resistivity observed in metallic ferromagnets at low temperature. The theory is shown to explain the observed spin relaxation time of Ni.

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