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Gyrotropic magnetic effect in Weyl semimetals SHUDAN ZHONG, JOEL MOORE, Univ of California - Berkeley, IVO SOUZA, Universidad del País Vasco — The transport current **J** induced in a clean metal by a magnetic field **B** is shown to be equivalent to the low-frequency limit of natural optical activity (optical gyrotropy). For a generic multiband Hamiltonian, there is a simple expression for $\alpha_{ij} = J_i/B_j$ in terms of the intrinsic magnetic moment (orbital plus spin) of the Bloch electrons on the Fermi surface. This "gyrotropic magnetic effect" (GME) is fundamentally different from the chiral magnetic effect (CME) driven by the chiral anomaly, which is only nonzero away from equilibrium and is governed by the Berry curvature. The two effects are compared for a minimal model of a Weyl semimetal. We discuss a simple semiclassical picture of the GME and its the possible experimental observation by measuring the rotary power of low-symmetry materials like $SrSi_2$.

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