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The Chiral Hall Effect in the Presence of Impurities: a Study on $\mathbf{Mn_{1-x}Fe_xSi}$[1] BENJAMIN CHAPMAN, University of Colorado, Boulder, THOMAS WOLF, Karlsruher Institute for Technology, MINHYEA LEE, University of Colorado, Boulder — Recently much attention has been paid to the itinerant ferromagnet MnSi. This is due largely to the emergence of an exotic topological object–the so-called skyrmion, which forms a lattice near T_c at ambient pressure. Past efforts to understand this configuration have observed its response to various perturbations, including temperature gradients, strong electric fields, and hydrostatic pressure. Here, we present Hall effect measurements on single crystals of Fe doped MnSi at ambient pressure, exploring how impurities interact with electronic charge and the long range magnetic order in this peculiar magnetic phase. In pure MnSi, the chiral Hall signal below T_c is significantly enhanced as T_c is suppressed by application of pressure. With chemical doping, though, the chiral Hall signal is substantially weakened, appearing in a narrower window of temperature and magnetic field relative to pure MnSi under pressure with comparable T_c. Interestingly, however, and in contrast to hall data taken under pressure, the chiral contribution in iron doped MnSi is found to have opposite sign as the anomalous Hall effect. We will discuss the implications of this Hall effect result and compare it to measurements on pure MnSi under pressure.

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