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Disorder-induced resistive anomaly at the Curie temperature CARSTEN TIMM, Free University Berlin, M.E. RAIKH, University of Utah, FELIX VON OPPEN, Free University Berlin — The resistive anomaly in disordered itinerant ferromagnets has a long history, dating back to the first observation by Gerlach in 1932. In 1968, Fisher and Langer proposed a theory for this anomaly based on anomalous scaling. We show that the resistivity $\rho(T)$ can exhibit a *stronger* singularity than predicted in that work. Close to the Curie temperature T_c the correlation length becomes large compared to the mean free path. Then, the quenched disorder is probed by *diffusive* carriers, which requires one to go beyond the Boltzmann description used in all previous works. Our approach combines ideas from the theory of random media and from mesoscopic physics. Specifically, we find that $d\rho/dT$ scales as $|T - T_c|^{-1/2}$ assuming Gaussian magnetic fluctuations. Our results are relevant for ferromagnets with low T_c, such as $SrRuO_3$ or diluted magnetic semiconductors, whose mobility near T_c is limited by disorder.

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