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Quantum Correction to Conductivity Close to Ferromagnetic Quantum Critical Point in Two Dimensions: Ballistic Regime INDRANIL PAUL, CEA-Saclay, CATHERINE PÉPIN, CEA-Saclay, BORIS NAROZHNY, The Abdus Salam ICTP, Trieste, DMITRI MASLOV, University of Florida, Gainesville — We study a two-dimensional disordered itinerant electron system close to a ferromagnetic quantum critical point. In the ballistic regime we calculate the temperature dependence of longitudinal conductivity as correction to the classical Drude term. Near the quantum critical point this temperature dependence has an exponent one-third, which is distinct from the linear temperature dependence of Fermi liquids. Away from the quantum critical point the temperature dependence crosses over to the usual Fermi liquid type. The origin of this behaviour is due to the difference in the two regimes in the momentum transferred by the spin fluctuations to the electrons during elastic scattering. Away from the criticality the momentum transferred depends on the mass of the spin fluctuations, while close to the criticality it depends on the Landau damping which brings additional temperature dependence.

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