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Crossover between T and T^2 electrical resistivity near an antiferromagnetic quantum critical point[1] DOMINIC BERGERON, BUMSOO KYUNG, VASYL HANKEVYCH, A.-M.S. TREMBLAY, Universite de Sherbrooke — To understand the ubiquitous linear term in the resistivity observed for the cuprates and other unconventional superconductors, we generalize the Two-Particle-Self-Consistent approach for the Hubbard model to include vertex corrections in the calculation of conductivity. Spin and charge fluctuations are included at all wavelengths. The vertex corrections allow the f-sum rule to be satisfied very accurately and are crucial contributions to the resistivity. Fitting the temperature dependence to a quadratic form, we obtain a linear term that decreases with increasing doping close to the antiferromagnetic quantum critical point. The quadratic term has a much weaker doping dependence. The linear term is also correlated with the T_c predicted by the same approach [1], in which both superconductivity and linear resistivity are caused by antiferromagnetic correlations. Our results agree qualitatively with recent experiments showing that the linear term vanishes concomitantly with the critical temperature T_c in the overdoped regime [2]. [1] Kyung et al. PRB 68, 174502 (2003) [2] Doiron-Leyraud et al. arXiv:0905.0964

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