# Highlights

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## Hydrodynamical description for magneto-transport in the strange metal phase of Bi-2201


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High-temperature superconductors are strongly coupled systems which present a complicated phase diagram with many coexisting phases. This makes it difficult to understand the mechanism which generates their singular transport properties. Hydrodynamics, which mostly relies on the symmetries of the system without referring to any specific microscopic mechanism, constitutes a promising framework to analyze these materials. In this paper we show that, in the strange metal phase of the cuprates, a whole set of transport coefficients are described by a universal hydrodynamic framework once one accounts for the effects of quantum critical charge-density waves. We corroborate our theoretical prediction by measuring the DC transport properties (resistivity, magnetoresistance, Hall angle, transverse thermal conductivity and Nernst effect) of Bi-2201 close to optimal doping (Fig. 1). The identification of defined *T*-scaling laws, consistent with the hydrodynamic predictions, proves the validity of our approach (Fig. 1). Our argument can be used as a consistency check to understand the universality class governing the behavior of high-temperature cuprate superconductors.

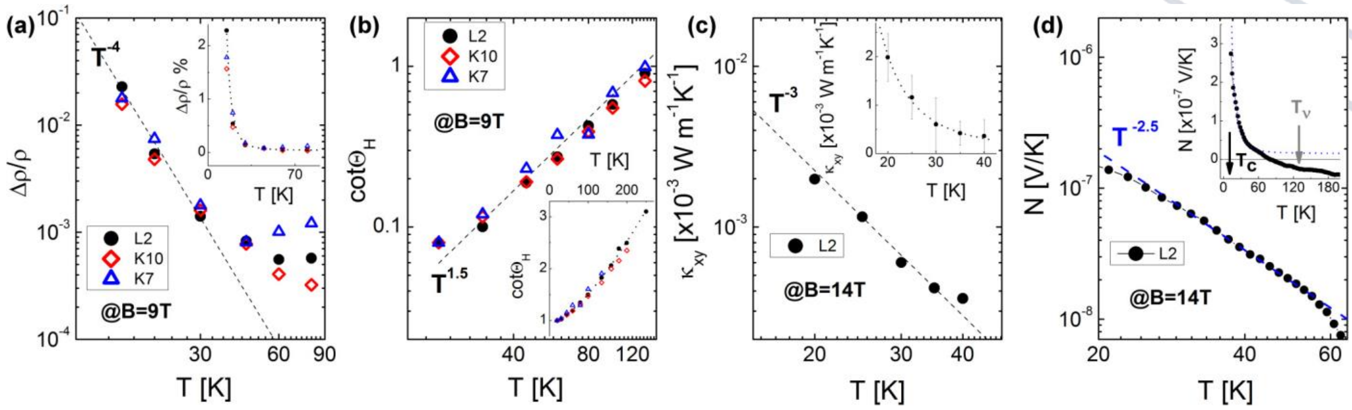


Fig. 1: Bi-logarithmic plot of (a) $\Delta\rho/\rho$ vs *T*, (b) cot $\Theta_H$ vs *T*, (c) $k_{xy}$ vs *T* and (d) *N* vs *T* for the Bi-2201 compounds. L2, K10 and K7 are three different samples. The dashed lines represent the different *T*-functions, which best reproduce the data in the temperature range 20 K < *T* < 60 K. The experimental scaling laws are consistent within the hydrodynamical model. Insets: linear plots of the data.