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Change of carrier density at the pseudogap critical point of a cuprate superconductor LOUIS TAILLEFER, SVEN BADOUX, GAEL GRISSONNANCHE, NICOLAS DOIRON-LEYRAUD, University of Sherbrooke, Sherbrooke, Canada, WOJCIECH TABIS, FRANCIS LALIBERTE, BAPTISTE VIGNOLLE, DAVID VIGNOLLES, JEROME BEARD, CYRIL PROUST, LNCMI, Toulouse, France, DOUG BONN, RUIXING LIANG, WALTER HARDY, University of British Columbia, Vancouver, Canada — The pseudogap is a central puzzle of cuprate superconductors. Its connection to the Mott insulator at low doping p remains ambiguous and its relation to the charge order that reconstructs the Fermi surface at intermediate p is still unclear. Here we use measurements of the Hall coefficient in magnetic fields up to 88 T to show that Fermi-surface reconstruction by charge order in $YBa_2Cu_3O_y$ ends sharply at a critical doping $p = 0.16$, distinctly lower than the pseudogap critical point at $p^\star = 0.19$. This shows that pseudogap and charge order are separate phenomena. We then find that the change of carrier density from $n = 1 + p$ in the conventional metal at high p to $n = p$ in the lightly doped regime at low p starts at $p^\star$. This shows that pseudogap and antiferromagnetic Mott insulator are linked.

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