Magnetic-field-induced stripe order in $YBa_2Cu_3O_y$

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In the search of the broken-symmetry state inferred from quantum oscillation and other transport measurements, we undertook high magnetic field NMR experiments in ultra clean, oxygen-ordered, untwined single crystals of $YBa_2Cu_3O_y$. We find that the translational symmetry breaking does not arise from the magnetic order anticipated by most of us, but from a unidirectional charge-ordered state. Because it occurs only in strong magnetic fields oriented along the crystalline c-axis, this charge order appears to compete with superconductivity. While two (orthogonal) ordered patterns are compatible with the NMR spectra, we argue that the charge ordered state is most likely the $4a$-periodic stripe phase 'a la Tranquada'. Nevertheless, we provide evidence that the stripe order remains partly fluctuating down to low temperatures. While the charge order is visibly pinned here by CuO chains, its occurrence at doping levels near 1/8 hole/Cu in a noticeably cleaner cuprate than e.g. $La_{2-x}Ba_xCuO_4$, strengthens the idea that stripe correlations are a generic propensity of charges in the CuO_2 planes of hole-doped cuprates.

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