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Composite Charge Order In Cuprate Superconductors ANDREY CHUBUKOV, University of Minnesota, YUXUAN WANG, Univ of Wisconsin, Madison — We analyze charge order in hole-doped cuprates. We argue that magnetically-mediated interaction, which is known to give rise to d-wave superconductivity, also gives rise to charge-density-wave instabilities with momenta $Q_x = (Q, 0)$ and $Q_y = (0, Q)$, as seen in the experiments. We show that the emerging charge order with Q_x/Q_y is of stripe type and that a stripe charge order parameter by itself has two components: one is incommensurate density variation, another is incommensurate current. Both components are non-zero in the CDW-ordered state, with the relative phase $\pm\pi/2$. Such an order breaks time reversal symmetry. We further show that, before a true incommensurate CDW order sets in, the system develops a pre-emptive composite order which breaks lattice rotational symmetry and time-reversal symmetry but preserves a translational $U(1)$ symmetry. We discuss the interplay between our CDW order and superconductivity and the spin-fluctuation scenario for the pseudogap phase.

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