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**Vortices and charge order in high-$T_c$ superconductors** MATTHIAS EINENKEL, Ruhr-Universität Bochum, National University of Science and Technology "MISiS," Moscow, HENDRIK MEIER, Yale University, CATHERINE PÉPIN, CEA-Saclay, KONSTANTIN B. EFETOV, Ruhr-Universität Bochum, National University of Science and Technology "MISiS," Moscow — We theoretically investigate the vortex state of the cuprate high-temperature superconductors in the presence of magnetic fields. Assuming the recently derived nonlinear $\sigma$-model for fluctuations in the pseudogap phase, we find that the vortex cores consist of two crossed regions of elliptic shape, in which a static charge order emerges. Charge density wave order manifests itself as satellites to the ordinary Bragg peaks directed along the axes of the reciprocal copper lattice. Quadrupole density wave (bond order) satellites, if seen, are predicted to be along the diagonals. The intensity of the satellites should grow linearly with the magnetic field, in agreement with the result of recent experiments.

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