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Spin-Fluctuation-Driven Nematic Charge-Density-Wave in Cuprate Superconductors: Charge-Orbital-Spin Multimode Fluctuations Caused by Vertex Corrections YOUICHI YAMAKAWA, MASAHISA TSUCHIIZU, HIROSHI KONTANI, Department of Physics, Nagoya University — We explain the recently discovered nematic charge-density-wave (CDW) state in cuprate superconductors on the basis of the three-orbital *d*-*p* Hubbard model, by including the vertex correction (VC) [1]. Due to the strong charge-spin interference given by the VC, the CDW instability at $q = (\Delta_{\rm FS}, 0)$, $(0, \Delta_{\rm FS})$ is strongly promoted near the magnetic critical point. Here, $\Delta_{\rm FS}$ is the wavenumber connected by the neighboring hot spots. The obtained spin-fluctuation-driven CDW is described as the "intra-unit-cell orbital order" accompanied by the charge transfer between the neighboring atomic orbitals. The obtained nematic-type charge pattern is similar to the STM results. The CDW in cuprates has a close relation to the nematic orbital order in Fe-based superconductors. [1] Y. Yamakawa and H. Kontani, arXiv:1406.7520.

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