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Nematicity in 3-band Hubbard model of cuprate superconductors

KYUNGMIN LEE, JUNPING SHAO, Cornell University, RICHARD SCALET-TAR, University of California - Davis, MICHAEL LAWLER, SUNY Binghamton, EUN-AH KIM, Cornell University — The recent discovery of intra-unit-cell nematicity in STM studies of cuprate superconductors [1] underscores the importance of the role played by oxygen orbitals in CuO₂ plane. Motivated by this observation we study 3-band Hubbard model using exact diagonalization. In particular, we investigate the effects various interaction parameters (U_d , U_p , V_{pd} , V_{pp}) have on nematicity. Interestingly, we find that U_d , the on-site repulsion at copper sites, enhances nematicity in the strongly coupled regime.

[1] Lawler, M. J. *et al.* Intra-unit-cell electronic nematicity of the high- T_c copper-oxide pseudogap states. *Nature* **466**, 347 (2010).

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