Abstract Submitted
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Possible competing order-induced Fermi arcs and self-consistent gap evolution with temperature in cuprate superconductors[1] G.P. LOCKHART, A.D. BEYER, M.L. TEAGUE, B.-L. YU, J.C.F. WANG, N.-C. YEH, Physics Dept., Caltech, Pasadena, CA — We explore, via numerical simulations, the possibility that competing orders (CO's) induce both the pseudogap (PG) and Fermi arc phenomena in cuprate superconductors. We find that both phenomena occur in hole-type cuprates if (1) a CO arises below a PG temperature T*, which is greater than the superconducting transition temperature, T_C, and (2) the periodic wave-vector of the CO, **Q**, is parallel to the Cu-O bonding direction. In contrast, neither phenomena is observed in electron-type cuprates because $T^*<T_C$, but we find evidence that the CO scenario may explain the so-called non-monotonic d-wave gap observed in electron-type cuprates for $T<T_C$ if **Q** is parallel to the nodal direction, as in the case of commensurate spin density waves. Finally, we consider a candidate model for self-consistently calculating the superconducting and CO energy gaps as a function of temperature and doping in the hole-type cuprates, as well as estimating the value of T*. Ref.: B.-L. Yu, *et.al.* [arxiv:0804.4028].

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