

Abstract Submitted
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Time-reversal symmetry breaking by a $(d + id)$ density-wave state in underdoped cuprate superconductors VICTOR YAKOVENKO, SUMANTA TEWARI, CHUANWEI ZHANG, SANKAR DAS SARMA, Department of Physics, University of Maryland — It was proposed that the $id_{x^2-y^2}$ density-wave state (DDW) may be responsible for the pseudogap behavior in the underdoped cuprates. Here we show that the admixture of a small d_{xy} component to the order parameter of the DDW state breaks macroscopic time reversal symmetry, leading to a non-zero polar Kerr effect. The d_{xy} component breaks the symmetry between the counter-propagating orbital currents of the DDW state, which is ultimately responsible for the non-zero Kerr signal. From the results of the recent experiments by Xia *et al.*, arXiv:0711.2494, we deduce that the amplitude of the d_{xy} admixture is quite small compared to the ordered DDW component.

Reference: S. Tewari, C. Zhang, V. M. Yakovenko, S. Das Sarma, arXiv:0711.2329.

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