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Chiral Texture of the Magnetic Moments of Unit-Cell Loop Currents in the Pseudogap Phase of Cuprate Superconductors SERGEY PERSHOGUBA, KOSTYA KECHEDZHI, VICTOR YAKOVENKO, University of Maryland — We propose a novel chiral order parameter to explain the unusual polar Kerr effect in underdoped cuprates. It is based on the loop-current model by Varma, which is characterized by the in-plane anapole moment \mathbf{N} and exhibits the magnetoelectric effect. We propose a helical structure where the vector $\mathbf{N}^{(n)}$ in the layer n is twisted by the angle $\pi/2$ relative to $\mathbf{N}^{(n-1)}$, thus breaking inversion symmetry. We show that coupling between magnetoelectric terms in the neighboring layers for this structure produces optical gyrotropy, which results in circular dichroism and the polar Kerr effect.

S. S. Pershoguba, K. Kechedzhi, and V. M. Yakovenko, Phys. Rev. Lett. **111**, 047005 (2013).

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