

Abstract Submitted  
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**Circular dichroism in angle-resolved photoemission spectrum as a technique to probe symmetry breaking in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$**  MATTI LINDROOS, VILLE ARPIAINEN, Tampere University of Technology, ARUN BANSIL, Northeastern University — We report first-principles computations of the ARPES response with circularly polarized light in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ . Comparison with available experimental results shows that the measured circular dichroism is reproduced within one-step computations, which include the effects of the ARPES matrix element. Employing the average orthorhombic crystal structure our study clearly establishes the sensitivity of the dichroism to experimental and structural details, and indicates that the detection of time-reversal symmetry breaking via ARPES using circularly polarized light will be complicated by the masking effects of the lattice distortions. Due to the surface sensitivity of ARPES dichroic measurements can be used to study the symmetry and quality of single crystal surfaces.

[1] V. Arpiainen, V. Zalobotnyy, A. A. Kordyuk, S. V. Borisenko, and M. Lindroos, Phys. Rev. B **77**, 024520 (2008)

[2] V. Arpiainen, A. Bansil, and M. Lindroos, Submitted to Phys. Rev. Lett. (2008)

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