Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Chiral Orbital Angular Momentum and Circular Dichroism ARPES in p- and d-orbital Bands JIN-HONG PARK, JUNG HOON HAN, Sungkyunkwan University — We derive explicit formulas relating the circular dichroism angle-resolved photoemission (CD-ARPES) signal to the existence of nonzero chiral orbital angular momentum (OAM) in the band structure. The existence of nonzero chiral OAM is a generic feature of surface states that break inversion symmetry, as pointed out in several recent articles [1-3]. We propose that CD-ARPES setup is an effective probe of the OAM of quasi-particles occupying the surface states. Explicit formulas for the *p*- and *d*-orbital bands are derived to show that the CD-ARPES signal is proportional to the OAM in the momentum space.

[1] S. R. Park, C. H. Kim, J. Yu, J. H. Han and C. Kim, Phys. Rev. Lett. **107**, 156803 (2011).
[2] S. R. Park *et al.*, arXiv:1103.0805 (2011).
[3] Choong H. Kim *et al.*, arXiv:1107.3285 (2011).

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Date submitted: 22 Dec 2011 Electronic form version 1.4