Resonant photoemission study of multiferroic $YMnO_3$ thin film

Manish Kumar, R. J. Choudhary and D. M. Phase

UGC-DAE Consortium for Scientific Research, Indore, M.P, India-452001

We have studied the electronic structure of pulsed laser deposited hexagonal-$YMnO_3$ film on Al_2O_3 (0001) substrate by photoemission spectroscopy using variable energy photon sources. The constant initial state (CIS) plots (obtained from resonance photoemission results) divulge the charge transfer nature of h-$YMnO_3$ and variation in strength of hybridization between oxygen 2p and Mn 3d states across the valence band region. The valence states sensitive to lattice distortion (inversion asymmetry) demonstrate the evolution of spin orbit interaction (SO). This SO along with its anisotropic behavior is well identified by the constant initial state plots. Since the effect of SO has its implications on the valence band spectra, it may affect the multiferroic properties in h-$YMnO_3$.

---

[1] Manish Kumar, R. J. Choudhary, and D. M. Phase, Appl. Phys. Lett. **102**, 182902 (2013)