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Interface properties of LaCrO3/SrTiO3 superlattices studied by standing-wave excited photoemission spectroscopy CHENG-TAI KUO, SHIH CHIEH LIN, Univ of California - Davis, RYAN COMES, Pacific Northwest National Laboratory, JULIEN RAULT, SOLEIL, PETER SUSHKO, Pacific Northwest National Laboratory, AMINA TALEB-IBRAHIMI, SOLEIL, SCOTT CHAMBERS, Pacific Northwest National Laboratory, CHUCK FADLEY, Univ of California - Davis, CHUCK FADLEY TEAM, SCOTT CHAMBERS TEAM, AMINA TALEB-IBRAHIMI TEAM — The interface between LaCrO3 (LCO) and SrTiO3 (STO) is of interest due to a polar discontinuity, built-in potential [1] and recent evidence of polarization in STO-LCO superlattices (SLs). However, an unambiguous depth profiling of the polarization-induced electronic structure has not been attempted. We here present the quantitative determination of the depth profiles of composition, charge state, potential and momentum-resolved electronic structure for LCO/STO SLs using resonant-excitation x-ray standing wave (SW) photoemission spectroscopy. By varying the incident angle and photon energy around the Bragg condition, the standing wave was moved vertically through the interfaces, giving us the ability to focus on either surface, interface or bulk electronic properties. We are thus able to decompose the valence band spectra into layer-specific contributions for both STO and LCO. We also present momentum-resolved electronic structure using resonant SW angle-resolved photoemission spectroscopy (SW-ARPES) [2] and compare these results to DFT theory for the band dispersions of each layer of the SL. [1] S. Chambers et al. PRL, 107, 206802 (2011) [2] A.X. Gray et al., EPL 104, 17004 (2013)

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