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X-ray absorption spectroscopy of doped Bi2Se3 and Bi2Te3 JESSICA MCCHESNEY, RICHARD ROSENBERG, DUCK YOUNG CHUNG, Argonne National Laboratory, MERCOURI KANATZIDIS, Argonne National Laboratory; Northwestern University — Topological insulators are a prototypical system to investigate correlated electron physics. Analogous to quantum hall states, these remarkable materials have conducting surface/edge states surrounding an insulating in the bulk state. Unlike quantum hall systems the conducting states of topological insulators do no arise from an applied magnetic field but instead emerge as a result of spin-orbit interactions. Furthermore, doping with different 3d-metals can significantly alter the electronic structure, inducing superconductivity in the case of CuxBi2-xSe3, and ferromagnetism in Bi2-xMnxTe3. In an effort to elucidate the role of the local bonding environment on the electronic structure in the chalchogenide topological insulators, Bi2Te3 and Bi2Se3 with various transition metal as dopants, we have preformed a series of soft x-ray absorption spectroscopy measurements.

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