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***In Situ* Angle-Resolved Photoemission Study of Gd-Doped EuO Thin Films** DANIEL SHAI, ALEXANDER MELVILLE, DAWEI SHEN, ERIC MONKMAN, JOHN HARTER, DARRELL SCHLOM, KYLE SHEN, Cornell University — We present an *in situ* angle-resolved photoemission study of electron-doped $Eu_{1-x}Gd_xO$ thin films grown by molecular beam epitaxy. Stoichiometric EuO orders ferromagnetically below $T_C = 69$ K, and with the addition of excess electrons, T_C can be increased to greater than 120 K. Additionally, in the electron-doped compound, a semiconductor to metal transition accompanies the paramagnetic to ferromagnetic transition. We show that the Gd dopants introduce electron pockets, which compose a Fermi surface that is clearly observable by photoemission. As the Gd concentration is increased, we observe that the Fermi surface maintains the same topology, but grows in volume. Additionally, by tracking the position and structure of the valence band as a function of doping, we show that with increasing Gd concentration, the chemical potential shifts toward the valence band in a manner that is entirely inconsistent with a rigid band shift. The relationship between these observations and density functional calculations will be discussed.

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