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Properties of a ferromagnetic semiconductor: epitaxial Co-doped SnO2 films JAMES BURST, MATTHIAS BATZILL, ULRIKE DIEBOLD, Tulane University — Room-temperature ferromagnetic semiconductors are sought for future spintronic applications. Co-doped SnO2 has been shown to be a dilute ferromagnetic material that exhibits a giant magnetic moment at room temperature [1]. Here we characterize thin Co-doped SnO2 films, epitaxially grown on r-cut alpha alumina by oxygen plasma assisted molecular beam epitaxy [2]. The films exhibit the rutile structure of the SnO2 host material with a (101) orientation with the Co dopants in a Co2+ high spin state. XPD establishes that these dopants occupy Sn sites and are not forming a secondary phase in the SnO2 matrix. Angle-resolved UPS has been employed to characterize the valance band of Co-doped and pure SnO2. Further physical and magnetic properties will also be discussed. [1] S.B. Ogale, et al, Phys. Rev. Let., 91, 7, 077205 (2003). [2] M. Batzill, et al, submitted to Thin Solid Films.

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