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The effect of uniaxial strain versus chemical doping on V_2O_3 thin films[1] CHRISTIAN URBAN, IVAN SCHULLER, Department of Physics and Center for Advanced Nanoscience, UC San Diego — Vanadium(III) oxide (V_2O_3) exhibits as a function of temperature a metal-insulator transition associated with a structural and a magnetic transition which can be influenced either by strain or chemical doping. We investigate the effect of doping and external pressure on V2O3 thin films. Due to the thin film geometry, application of pressure results in a uniaxial strain perpendicular to the surface. In contrast, chemical doping causes isotropic strain. The interplay of the different strains is reflected in the electrical transport behavior throughout the phase transition. Doping with Ti and Cr is employed in highly oriented films to cover a large portion of the phase diagram. Application of external pressure on doped films tests the commonly unquestioned equivalence of doping and pressure. Additionally, we investigate the interplay of doping and pressure on the transition temperature and transport properties.

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