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Optical Properties of Titanium Dioxide and Vanadium Oxide Thin Films NICHOLAS BORUCKI, SAGE EDWARDS, TOM ODER, Department of Physics and Astronomy, Youngstown State University — Titanium dioxide films are deposited from a 99.99% pure target using magnetron sputter deposition on sapphire substrates at 20 °C and 700 °C. The films were then annealed in an argon/oxygen atmosphere using a rapid thermal processor at 500 °C and 900 °C for 5 minutes. The transmittance, reflectance and absorbance of the films are determined by UV-VIS spectrometer under normal incidence in the spectral range 200 nm – 2500 nm. The direct and indirect bandgaps extracted from these measurements were in the range of 2.7 – 3.3 eV. Additional optical data on these films annealed after deposition as well as electrical resistivity measurements will be presented. The vanadium oxide films were made by first depositing a 200 nm-thick film of vanadium on sapphire substrate at room temperature and annealing the films in an oxygen atmosphere for 15 – 30 min at 700 °C. The optical measurements revealed a low transmission of about 50% and optical bandgaps of 2.3 *textendash* 2.6 eV.

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