

Abstract Submitted  
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**Dielectric and optical properties of SrTiO<sub>3</sub> films deposited from metallo-organic solution** M. SPIES, L.S. ABDALLAH, S. ZOLLNER, NMSU, C.V. WEISS, J. ZHANG, S.P. ALPAY, U of Connecticut, M.W. COLE, Army Research Lab — SrTiO<sub>3</sub> thin films on Si were grown by metallo-organic solution deposition. Spectroscopic ellipsometry was used to determine the ellipsometric angles  $\psi$  and  $\Delta$  in the 0.6 to 6.6 eV spectral range at three angles of incidence. From the region below 3.5 eV (where the films are transparent), we are able to determine the refractive index and the film thickness, which ranges from 140 to 340 nm for different films. The refractive index is similar for all of our films, but 25% lower than that of bulk SrTiO<sub>3</sub>. By contrast, the low-frequency dielectric constant of similar films grown on metalized Si substrates is about the same as bulk SrTiO<sub>3</sub>. Using a B-spline parametrization, we are able to determine the dielectric function of our films from the ellipsometric angles. We find an onset of absorption (band gap) of about 3.7 eV and similar interband electronic transitions of our films as for bulk SrTiO<sub>3</sub>. For our films, the interband peaks are broadened due to poly-crystalline disorder and have a lower amplitude. The reason for the discrepancy between the low-frequency (vibrational) and the high-frequency (electronic) dielectric constant is unclear.

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