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Comparison of the Dielectric Function of $SrTiO_3$ on $SrTiO_3$, Si and Ge Substrates CESAR RODRIGUEZ, NUWANJULA SAMARASINGHA, JAIME MOYA, STEFAN ZOLLNER, Department of Physics, New Mexico State University, PATRICK PONATH, ALEX DEMKOV, Department of Physics, The University of Texas at Austin — A comprehensive study of the optical properties of SrTiO3 (STO) on three different substrates has been conducted using variable angle spectroscopic ellipsometry. STO is a perovskite and has drawn much attention due to its wide range of applications in microelectronics. The STO thin films were grown by molecular beam epitaxy on top of Ge, Si and STO substrates. Using spectroscopic ellipsometry, we studied the films using a broad energy range of 0.76 - 6.6 eV, and using a range of incident angles from 65-75 degrees. This allowed us to collect the spectroscopic angles Ψ and Δ. We used a parametric oscillator model to fit the data of the STO films and added a Lorentzian term to fit the IR region. This allowed us to determine the thickness of each film from which we then extracted the optical constants. From these results we compared the behavior of the dielectric function of STO on a chosen substrate to that of bulk STO.

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