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Optical properties of epitaxial $Ba_{1-x}Sr_xTiO_3$ films on MgO(100) substrates S.G. CHOI, Q.X. JIA, A.M. DATTELBAUM, S.T. PICRAUX, Los Alamos National Laboratory — We present optical properties of $Ba_xSr_{1-x}TiO_3$ ($0.0 \leq x \leq 1.0$) films grown epitaxially by pulsed laser deposition (PLD) on MgO (100) substrates. Nominal thickness of the grown layers was 5000Å. Room-temperature pseudodielectric function spectra $< \varepsilon > = < \varepsilon_1 > + i < \varepsilon_2 >$ of the alloys were measured by spectroscopic ellipsometry from 1.5 to 5.0 eV. The spectra obtained exhibit two critical-point structures at $\sim$ 4.2 and $\sim$ 4.8 eV as well as the fundamental absorption edge (the E_0) below 4 eV. Analysis of second energy derivatives calculated numerically from the measured date yielded critical-point energies of interband transitions. Dependence of critical-point energies on alloy composition is discussed.

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