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Title:Strain-induced ferroelectricity of a SrTiO<inf>3</inf> thin film on a MgAl<inf>2</inf>O<inf>4</inf> substrate observed by terahertz time-domain spectroscopy
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Abstract:A SrTiO<inf>3</inf> thin film was deposited on a MgAl<inf>2</inf>O <inf>4</inf>(100) substrate with a 3.5 % larger lattice constant than that of the SrTiO<inf>3</inf>. The temperature dependence of the dielectric dispersion of the SrTiO<inf>3</inf> thin film was measured by terahertz time-domain spectroscopy, and the dielectric strength and soft-mode frequency showed positive and negative peaks at around 170 K, respectively. In addition, a deviation of the dielectric constant from the theoretical fitting curve in the gigahertz range and an increase in the value of the damping factor were observed below the ferroelectric transition temperature. These phenomena strongly indicate the emergence of ferroelectricity at around 170 K. © 2011 Springer Science+Business Media, LLC.
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