

Dielectric Properties of Substrates for Deposition of High-Tc Thin Films Up to 40 GHz

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Dielectric properties of CaNdAlO_3 , LaAlO_3 , SrLaAlO_3 , $\text{SrLaGa}_3\text{O}_{10}$ and NdGaO_3 monocrystals, prospective substrate materials for the deposition of thin films of high-temperature superconductors, were measured with high accuracy at frequencies up to 40 GHz in the temperature range 10 to 300 K. Most materials exhibit uniaxial anisotropy with ϵ_r ranging from 8.88 ($\text{SrLaGa}_3\text{O}_{10}$ along optical c-axis) to 24.18 (LaAlO_3). A decrease of ϵ_r with temperature decrease was observed in all materials except CaNdAlO_3 (perpendicular to c-axis) where ϵ_r increases. Microwave losses in LaAlO_3 , SrLaAlO_3 and $\text{SrLaGa}_3\text{O}_{10}$ decrease with temperature while CaNdAlO_3 and NdGaO_3 pronounced loss increase was found at temperatures below 100 K. We suggest, that in the latter materials at lower temperatures, neodymium ions become magnetically ordered and are responsible for the observed effects.

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