

Abstracts

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

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Dielectric properties of CaNdAlO₄, LaAlO₃, SrLaAlO₄, SrLaGa₃O₇ and NdGaO₃ 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 $\epsilon_{\parallel\text{sub} r}$ ranging from 8.88 (SrLaGa₃O₇ along optical c-axis) to 24.18 (LaAlO₃). A decrease of $\epsilon_{\parallel\text{sub} r}$ with temperature decrease was observed in all materials except CaNdAlO₄ (perpendicular to c-axis) where $\epsilon_{\parallel\text{sub} r}$ increases. Microwave losses in LaAlO₃, SrLaAlO₄ and SrLaGa₃O₇ decrease with temperature while CaNdAlO₄ and NdGaO₃ 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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