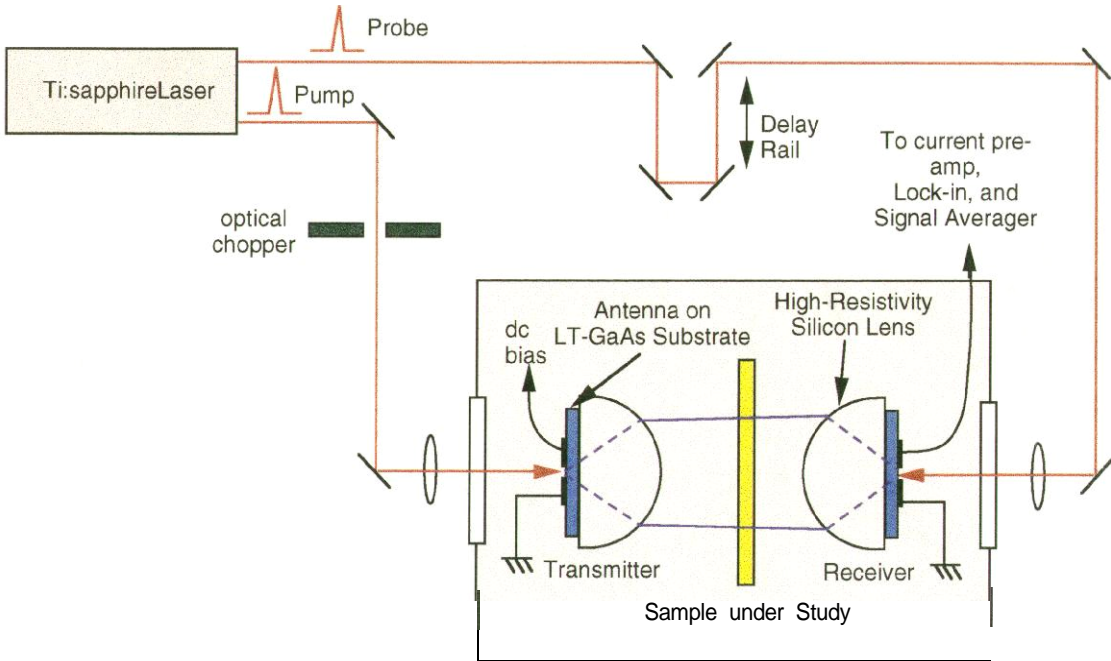


*Coherent Time-Domain
Spectrometer and Terahertz
Properties of Dielectric Substrates*

John Whitaker

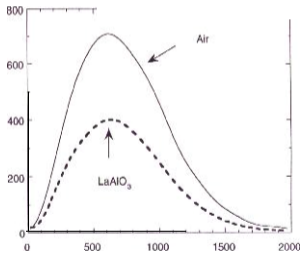
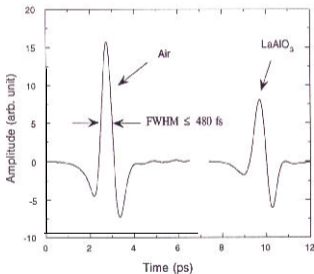
Center for Ultrafast Optical Science
University of Michigan, Ann Arbor, MI

Coherent Time-Domain Spectrometer

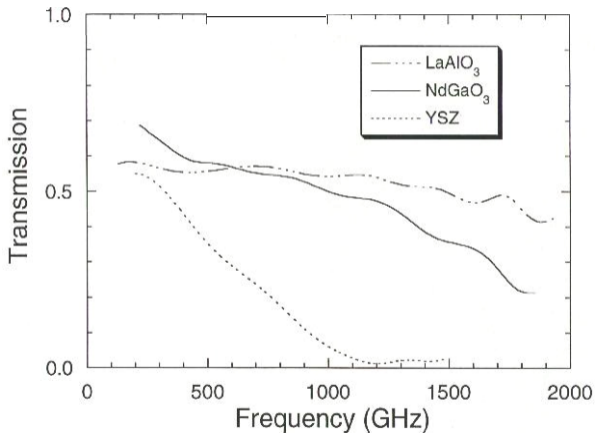


Continuous-Flow Cryostat With Optical Access

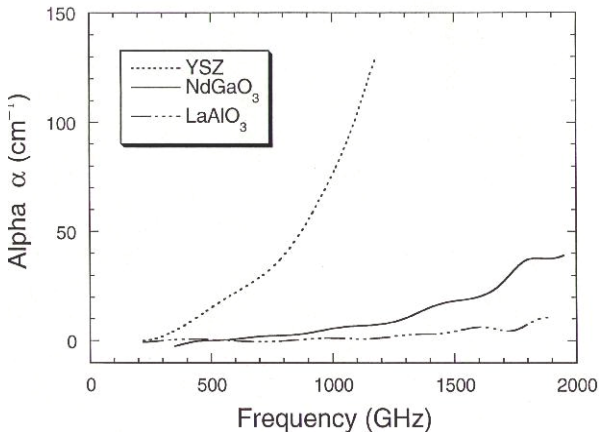
Time-Domain Waveforms and Frequency-Domain Spectra for Radiation Through Air and LaAlO₃ Substrates



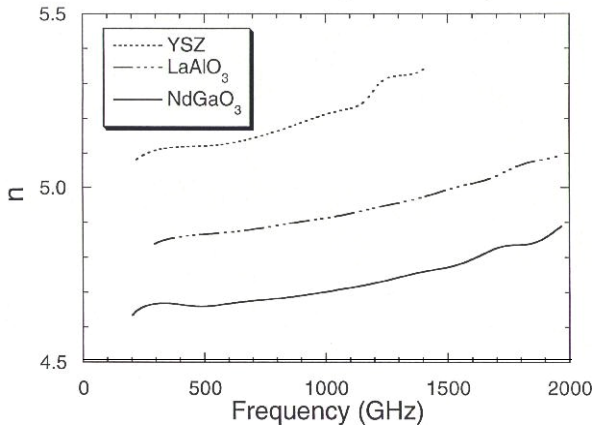
Electric-Field Transmission for Terahertz-Beam Propagation through Dielectric Substrates



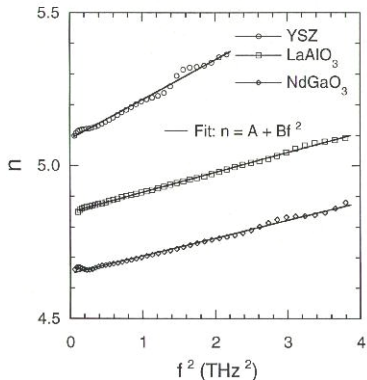
Absorption Coefficients for Yttria-Stabilized Zirconia, NdGaO_3 and LaAlO_3 Substrates



Index of Refraction for Yttria-Stabilized Zirconia, LaAlO_3 and NdGaO_3 Substrates



Index of Refraction vs. Frequency Squared for Ytria-Stabilized Zirconia LaAlO_3 and NdGaO_3 Substrates



Lorentz Model Approximation
for Low Frequencies:

$$A = f_p / f_0, \quad B = f_p / 2f_0^3$$

	A	B	f_0 (THz)	f_p (THz)
YSZ	5.09	0.131	4.4	22.5
LaAlO_3	4.85	0.066	6.1	29.5
NdGaO_3	4.65	0.058	6.3	29.4