Specifications of Terahertz Facilities at the University of Arkansas

Spectroscopy

THz source/detector:	Laser gated photo-conductive semiconductor
Laser:	Ultra short pulsed laser, 790nm
Spectral range:	0.06 THz - 3 THz (2 cm-1 – 100 cm-1)
Dynamic range:	> 4 OD at 0.9 THz (30 cm-1)
Spectral resolution:	0.0075 THz (0.25 cm-1)
Wavelength accuracy:	0.0023 THz (0.075 cm-1)
Purge:	Nitrogen (N2) or dry-air purge as standard
Data acquisition rate:	30 scans/sec at 1.2 cm-1 spectral resolution
Signal to noise ratio:	from ~65dB at 0.15 THz to ~43dB at 2.58 THz
Operating temp:	18o C (64o F) to 30o C (86o F)

Imaging Module in Reflectance

Spatial resolution:	160 μm at surface and 320 μm at 1 mm depth (at 2.58 THz)
Axial resolution:	40 μm at surface and 80 μm at 1 mm depth:
Precision:	20 μm (spatial) and 2 μm (axial)
Scan area:	up to 100 mm x 100 mm
Pixel resolution:	up to 500 x 500 pixels
Pixel collection rate:	60 msec
Image acquisition rate:	12 minutes at 100 x 100 pixels

Imaging Module in Transmission	Allows automatic collection of spectra over an area of 19 mm × 19 mm, with a measurement spacing of between 50 and 500 microns.
Gantry System	To scan up to a 70 cm × 70 cm area. A gantry including thru-transmission and reflection imaging modes at near normal incidence and 50 mm focal distance.
Cryostat	The cryostat enables THz spectroscopy to be performed on super/semi-conducting materials and many other types of samples within a range of temperatures from 3.4K to 300K with OPTIHTR adjustable sample rod and holder. Allows 32mm height adjustment to within 0.5mm and 360 degrees of rotation to an accuracy of 10.
Heated Cell	Electrically heated cell to heat samples up to 250 C. TPS spectra 3000 Heated Cell, Chiller Kit. Re-circulating water chiller for the Specac Electrically Heated cell.