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: 18°C (64°F) to 30°C (86°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. Recirculating water chiller for the Specac Electrically Heated cell.