

A COMPARISON BETWEEN SCANNING SPECTRORADIOMETERS AND FTIR INSTRUMENTS

Recently many Fourier Transform Infrared (*FTIR*) Spectrometer manufacturers have begun marketing their product for use in spectroradiometric source spectral analysis applications. Although there are some applications where FTIR methods have clear advantages against gratings-based scanning Czerny-Turner-type scanning monochromator spectroradiometers, for some other applications Optronic Laboratories does not recommend FTIRs for such applications from a metrological point of view.

The biggest disadvantage FTIR has in doing radiometry is the non-linearity of the detectors available. The National Physical Laboratory in the UK (*the equivalent to NIST in the US*) performed many studies on this and found the linearity of IR detectors is worse than previously thought and hence incompatible with the high dynamic range requirements of FTIR. The FTIR interferogram always consists of a central burst, where all of the light intensity at all wavelengths is simultaneously measured, and an outlying pattern that reveals the individual wavelength components. Since the dynamic range between these features may be 4-6 decades, linearity is critical in obtaining good data - linearity that is unfortunately lacking. The scanning approach has no such central burst, requires less dynamic range performance from the detectors, and hence is far more accurate.

In addition, compared to scanning spectroradiometers, FTIR type spectroradiometers offer:

- 1 Poorer linearity across different sensitivity range
- 2 Less spectral distribution accuracy arising from potential vibration of the interferometer
- 3 Difficulties in calibration for absolute measurements
- 4 Easily affected by temperature changes
- 5 Cannot be upgraded to other spectral ranges

Some FTIR manufacturers have created confusion by publishing misleading and confusing specifications in an effort promote these instruments into such poorly matched applications in order expand their markets. We believe that such efforts are a disservice to the light measurements community.

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As part of our policy of continuous product improvement, we reserve the right to change specifications at any time.