

Overall Summary

At present, TES L1B data products have systematic errors that need to be resolved and/or mitigated. These errors are both target scene dependent and frequency dependent, especially across the 4 TES focal planes that measure different frequency ranges. The error estimates given below are representative for the nadir data currently available. Errors specific to each target spectrum are available within the data products. In general, the radiometric calibration procedure is less reliable for limb observations leading to calibration failures and missing data. We will be providing improved calibrated radiances including limb radiances in late 2005 as new algorithms are tested and developed.

Precision

Precision estimates are given in the NESR (Noise Equivalent Spectral Radiance) part of the L1B product, available with each target spectral radiance. The NESR is estimated for each measured spectrum using the noise extracted from the spectral range outside the signal region allowed by the TES optical filter used for the measurement.

Average single detector, single scan Nadir NESRs

Filter	Freq Range (cm-1)	Nadir NESR (nW/cm2/sr/cm-1)
2B1	650 - 930	700
1B2	920 - 1160	200
2A1	1090 - 1350	150
1A1	1890 - 2260	100

Systematic Errors

We estimate our systematic errors after radiometric calibration using the residual radiance in the imaginary term after complex calibration. We estimate an average radiance error around 2% from these terms for our nadir spectra. This radiance residual is affected by errors in the phase alignment process as well as time variability that is neglected in the calibration process. Both of these error sources are being investigated.

Validation Status

We have compared nadir TES L1B calibrated radiance spectra to Aqua-AIRS radiances by first convolving TES spectra with the AIRS spectral response function (SRF). Distributions of AIRS-TES differences in observed brightness temperature for homogenous targets (as determined by TES) have a FWHM (full-width half maximum) < 1K.

We are also in the process of comparing TES radiances to S-HIS (Scanning- High Resolution Spectrometer) measurements taken from the WB-57 during the first AVE (Aura Validation Experiment) Oct-Nov. 2004.