



MC2750 EP-NIR: Long Term Photometric Response Stability.

SUMMARY: An Aspectrics MC2750 EP-NIR spectrometer was tested for long-term photometric response stability. Absorbance spectra were collected every 30 second over a period of 2 days 21 hours 22 ½ minutes (8,325 consecutive spectra). Once the Near IR halogen source was stabilized, the spectral region monitored (2013-2057 nm) stabilized at an average of 100.13 ± 0.026 % Transmission for the duration of the entire experiment.

An Aspectrics MC2750 Encoded Photometrics Near Infrared (EP-NIR) spectrometer covering the 1375-2750 nm spectral range for access to combination bands information was tested for long-term stability of instrumental response, a problem known to affect other Near IR instruments.

Optical configuration consisted of the use of an external halogen source, a low-OH optic fiber and an SMA905 interface to connect to the EP-NIR. As soon as the halogen source was turned on, a reference background spectrum was collected (30 second scan). No other background spectra were collected thereafter. The instrument was left to collect consecutive 30-second absorbance spectra over a period of almost 3 days (2 days, 21 hours and 22 ½ minutes).

% Transmission was calculated for EP-NIR bins 60-64 corresponding to the spectral window 2013-2057 nm. The calculated % Transmission values were plotted as a function of time in order to demonstrate long-term instrumental photometric response stability.

After an initial period of approximately 480 minutes (8 hours) during which the signal increased from 100.0 %T to 100.19 %T attributed to the stabilization of the halogen source, the signal stabilized at an average value of 100.13 ± 0.026 %T for the duration of the experiment.

Maximum transmission observed over the experiment (after the source had stabilized) was 100.21 %T and minimum was 100.05 %T.

This experiment proves the long-term stability of EP-NIR instrumental photometric response.

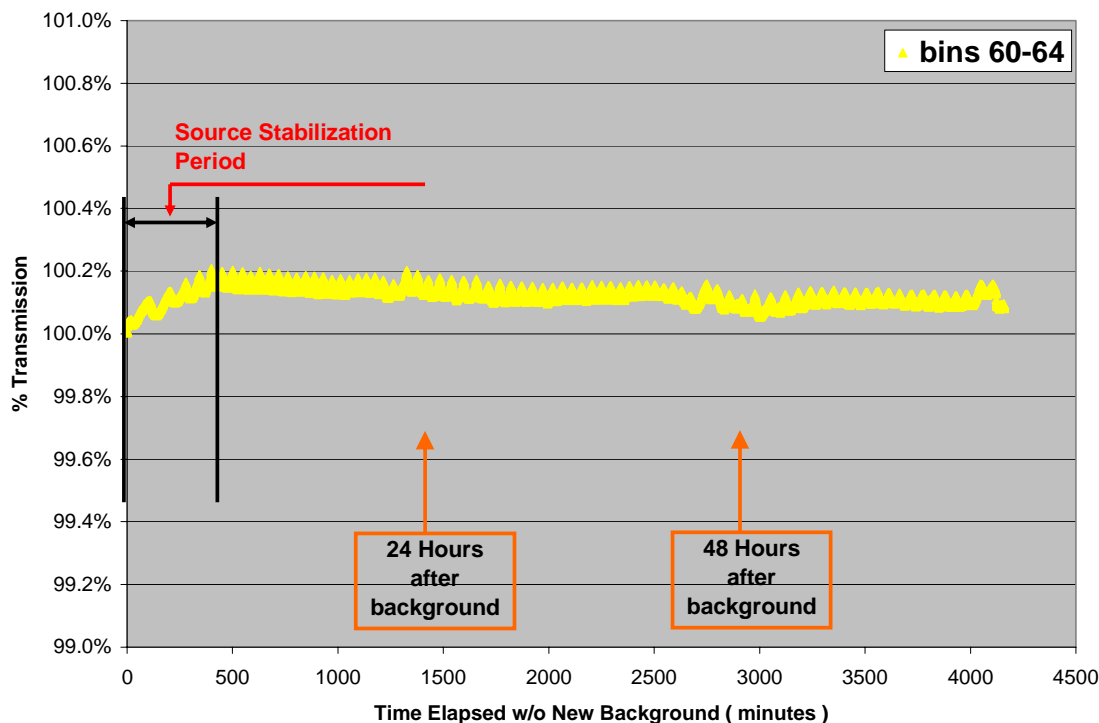


Figure 1: Photometric response (%T) of EP-NIR bins 60-64 (corresponding to spectral range 2013-2057 nm) as a function of time.

Source was not pre-heated when the initial reference background spectrum was collected. No other background spectrum was collected over a 3-day period. Once source has stabilized, signal stabilized on the average value of 100.13 ± 0.026 %T for the duration of the experiment.

Maximum variation observed over the (almost) three-day experiment was only 0.153%T.