MEMORANDUM FOR The Record

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SUBJECT MetOp-B/HIRS/H307 Spectral Response Functions

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The Spectral Response Functions (SRFs) of the 19 infrared channels of HIRS for MetOp-B have been generated based on the optical piece part spectral response of this instrument.

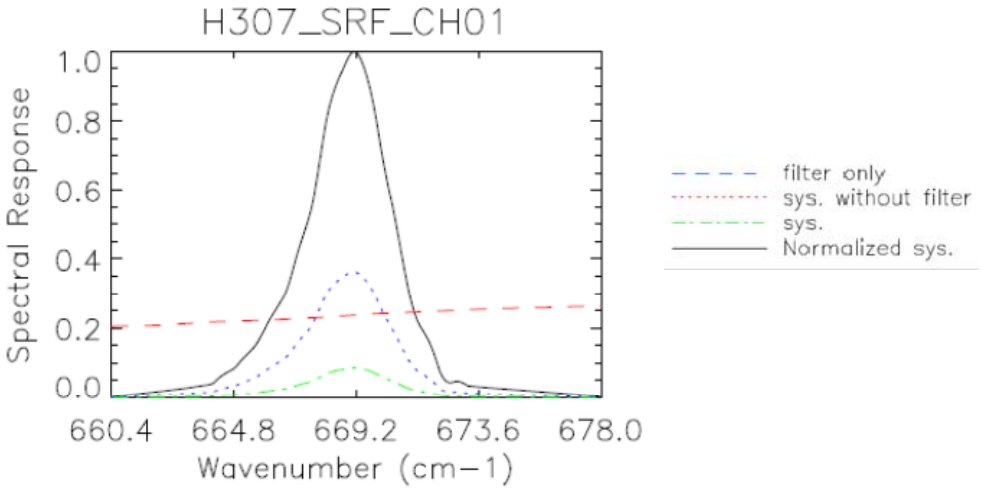
1). MTBH307srf.txt: The spectral response functions in ASCII with a format identical to those from the previous instruments, i.e.,

Ch1 # of data points
Wavenumber filter transmittance sys. w/o filter total sys normalized total sys.
….
Ch2 # of data points
….

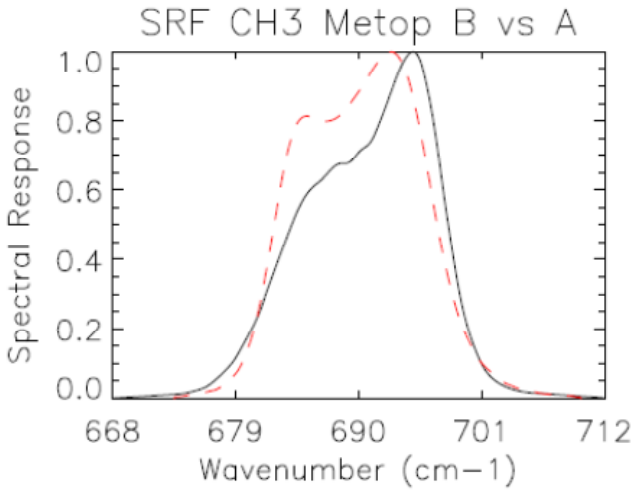
2). MTBH307cwnbc.txt: an ASCII file that contains the center wavenumber and band correction coefficients.

3). MTBH307SRF_memo.pdf: a short memo about the spectral response functions (this file).

4). MTBH307srf.pdf: The spectral response function in graphic format. An example for channel 1 is shown below.



5). MTBH307srfcompare.pdf: Graphic comparison of SRFs with those from MetOp-A HIRS. An example for channel 3 is shown below. The black curve is the SRF for MetOp-B HIRS and red curve is for MetOp-A.



6) HIRS level 1b data users should use the following procedure to convert the Earth scene radiance R into brightness temperature T (Weinreb, et al, 1981, NOAA Technical Report NESS 85):

$$T^* = c_2 \nu \ln(c_1 \nu^3 / R + 1)$$
$$T = (T^* - b)/c$$

Where :

R = scene radiance (mW/[m^2 sr cm^{-1}])
T* = effective temperature (K)
c_1= 1.1910427E-5 mW/(m^2 sr cm^{-4})
c_2 = 1.4387752 (K cm)
ν = center wavenumber (cm^{-1})
T = scene brightness temperature (K)
b and c = band correction coefficients. b unit is K.

For additional information about the MetOp-B/HIRS spectral response functions, please contact us at: changyong.cao@noaa.gov or tiejun.chang@noaa.gov