

MEMORANDUM FOR The Record

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SUBJECT MetOp-A/HIRS/H306 Spectral Response Functions

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The Spectral Response Functions (SRFs) of the 19 infrared channels of HIRS for MetOp-A have been generated based on the optical piece part spectral response of this instrument. All related data are now available on the web at <http://www.orbit.nesdis.noaa.gov/smcd/spb/calibration/icvs/index.html>. From the menu, select “IR Sounders” → “HIRS Spectral Response Functions”, where the following files can be downloaded:

1). MTAH306srf.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). MTAH306cwnbc.txt: an ASCII file that contains the center wavenumber and band correction coefficients.

3). MTAH306SRF_memo.pdf: a short memo about the spectral response functions (this file).

4). MTAH306srf.pdf: The spectral response function in graphic format.

5). MTAH306srfcompare.pdf: Graphic comparison of SRFs with those from previous instruments.

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):

$$T^* = \frac{c_2 v}{\ln(c_1 v^3 / R + 1)}$$

$$T = (T^* - b)/c$$

Where

R = scene radiance ($\text{mW}/[\text{m}^2 \text{ sr cm}^{-1}]$)

T^* = effective temperature

$c_1 = 1.1910427\text{E-}5 \text{ mW}/(\text{m}^2 \text{ sr cm}^{-4})$

$c_2 = 1.4387752 \text{ (K cm)}$

ν = center wavenumber (cm^{-1})

T = scene brightness temperature

b , and c = band correction coefficients.

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