To: The Record

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Re: **G17 ABI IR New SRF Review**

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1. **Issue**s (ADR860/WR6888/WR6708)

ADR860: GOES-17 ABI B16 has relatively large radiance bias to the collocated low-earth-orbit hyperspectral radiometer data. During the "cold" FPM temperature period, the mean brightness temperature (Tb) biases to the all CrIS and IASI measurements for this channel are all about 0.45K. It is known that SRF is dependent on detector operating temperature and the radiometric calibration accuracy for the absorptive channels can be very sensitive to the spectral calibration uncertainty. Since GOES-17 ABI operates at higher temperature, it is suggested that the vendor investigate the dependency of SRF on temperature for all the channels.

2. **Procedures**

7/15/2019: ABI-Harris provided closure memo and attachments:
ABI-19-248_WR6708_Dependency_of_G17_ABI_SRF_on_FPM_Temperature_Closure_Memo.docx
ABI-19-166_FM-02-Pseudo-Angen-for-Increased-FPM-Temps.zip

8/22/2019: CWG assessed the new SRF at 81K/90K/110K and reported the results at CWG meetings. Proposed to implement the SRF at 81K.

10/16/2019: ITE testing.

3. **Conclusion**

We validated the 81K SRF during the period of GOES-17 ABI operation when FPM temperature is stable at 81K. It led to radiance in significantly better agreement with other well calibrated sensors (IASI-A/B/C, CrIS, GOES-16). With pending approval, the 81K SRF will be used for GOES-17 ABI operation, replacing the 60K SRF that was determined pre-launch and has been used since launch, and improve GOES-17 ABI radiance accuracy.

The other SRFs (at 90K & 110K) altered the calibrated radiance as expected in terms of sign, magnitude, and spectral variation. These are partial validation that these SRFs seem appropriate for the specified FPM temperatures. These SRFs can be valuable, for example for anomaly resolution, research, re-processing, etc. Since only one SRF can be used for operation, and FPM temperature is closer to 81K than to 90K or 110K for majority of the time, these SRFs are not planned for operational use.