

## ITSC-17 Advanced Sounder WG Action Outcomes

- **Recommendation AS-1 for space agencies and NWP centers**

To support the use of hyperspectral geostationary imager products, such as GIFTS/STORM data, for research and development of hyperspectral infrared geostationary sounder products in advance of operational instruments (e.g., MTG-IRS).

Response of NOAA (Mitch Goldberg)

Response of EUMETSAT (, Stephen Tjemkes, Peter Schluessel, Dieter Klaes)

- **Action AS-1**

For David Crain to publicize information on data availability of the GIFTS/STORM to Advanced Sounder Working group to encourage early use of these radiances.

- **Action AS-2**

Brian Kahn, starting from the existing WMO database containing the requirements of the World Climatological Research Program (WCRP), to survey the science community for their observational needs with respect to climate related processes and report back to the group.

Target Observable	Sounder Variable	Accuracy	Approach	Remarks
Lower Tropospheric Stability (LTS)	T	2 K	Difference $\theta$ between 700–1000 hPa	PBL Cloud Amount
PBL Depth	Altitude	100 m	Maximum $\Gamma_{\theta}$ , $\Gamma_q$ , or $\Gamma_{RH}$	PBL Cloud Top Entrainment
PBL Decoupling	Altitude	500 m (?)	Vertical Structure of $\Gamma_{\theta}$ / $\Gamma_q$ / $\Gamma_{RH}$	PBL Cloud Transition
PBL Inversion Strength	T	1–2 K	Magnitude of $\Gamma_{\theta}$	PBL Processes
Tropopause Height	Altitude	1 km	Maximum $\Gamma_{\theta}$	Convection/Global Circulation
UT/LS Humidity	T/q	1 K 2 ppmv	RH Magnitude of q	Convection/Hydration of UT/LS
HDO (Water Vapor Isotopes)	q and $q_{HDO}$	(?)	$q_{HDO}/q_{H_2O} \sim \delta D$	Convection and Precipitation Processes
<sup>a</sup> Moist Conserved Thermo Variables ( $q_i$ and $\theta_i$ )	T/q/LWC	1 K 1–2 g/kg	Sounder $\theta/q$ + profiles of LWC	Climate Model Evaluation and Parameterization

<sup>a</sup>May require sounder and imager/active radar combination

- **Recommendation AS-2 to the research community**

Review trade-off studies used to determine spectral, spatial and noise tradeoffs for determining operational advanced infrared sounder specifications with reference to optimal field of view for cloud avoidance and the use of noise reduction processing techniques and/or new detector array technology.

- **Recommendation AS-3 to the research community**

Explore the possibility of setting up a community science working group to explore these

Issues.

- **Action AS-3**

Andrew Collard to initiate discussion on how to proceed with these recommendations.

***Still to be done.***

- **Recommendation AS-4 to space agencies**

To ensure the continuation of capability for conically scanning instruments in the post DMSP era. All future such instruments should be designed with particular attention to calibration accuracy and stability.

## Action AS-4

ITWG Co-Chairs to present the concern of this group to CGMS.

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## Action AS-5

David Crain and Steve English to take the WMO Global Observing System Dossier on current operational systems and produce a simplified table for the Advanced Sounder Working Group report by September 2010.

Sensor	Type	Satellite	Orbit Location	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
GOES SOUNDER	Radiometer	GOES 11/14	135 W	X	X	X							
GOES SOUNDER	Radiometer	GOES 13/15	75 W	X	X	X	X	X	X	X			
INSAT SOUNDER	Radiometer	Insat 3-D	83 E	X	X	X	X	X					
IIS	Interferometer	FY-4 A/C	86.5 E	X	X	X	X	X	X	X	X	X	X
IIS	Interferometer	FY-4 B/D	123 E			X	X	X	X	X	X	X	X
GMW STORM-1	Interferometer	JSAT 110 E	110 E			X	X	X	X	X	X	X	X
GMW STORM-2	Interferometer	TBD	70-130 W				X	X	X	X	X	X	X
GMW STORM-3	Interferometer	TBD	170-180 E					X	X	X	X	X	X
MTG IRS	Interferometer	MTG-S	0					X	X	X	X	X	X
GMW STORM-4	Interferometer	TBD	50 E						X	X	X	X	X
GMW STORM-5	Interferometer	TBD	70-130 W							X	X	X	X
GMW STORM-6	Interferometer	Spare				X		X	X	X	X	X	X

### **Recommendation AS-5**

In concert with the continued development of IR geo sounders, we recommend the further advancement of geostationary microwave sounders.

### **Action AS-6**

Advanced sounder working group to critically review the document produced above.

# *ITSC-18 Issues*

- **New data:** Meteor-M, FY3B, Metop-B, NPP, commercial launches e.g. GIFTS/STORM, Iridium (also IIFS; DA/NWP; RT & SSSP)
- **Hyperspectral sounders (IR and Microwave):** case for high spectral resolution MW
- **Infrared FOV size:** trade off versus other characteristics (also DA/NWP; Cli & SSSP)
- **Apodization for CrIS and MTG IRS:** case for dissimulation of non-apodised spectra to preserve hyperspectral resolution information content of the CrIS and MTG IRS. Need for RT development for unapodized spectra (also RT)
- **High Spatial Resolution IR Sounder:** case for increasing detector array density of CrIS and IASI to provide 1-2 km spatial resolution within existing 45-km FOR