

Action status

Advanced Sounder Working Group

## 2.4 ADVANCED SOUNDERS

*Web site:* <http://cimss.ssec.wisc.edu/itwg/aswg/>

*Working Group members: Dieter Klaes (Co-Chair, EUMETSAT), William L. Smith (Co-Chair, SSEC/UW-Madison and Hampton Univ.), Chris Barnet (Science and Technology Corp.), Eric Fetzer (JPL, CA Inst. of Tech.), Chawn Harlow (Met Office), Allen Huang (CIMSS/SSEC/UW-Madison), Dohyeong Kim (NMSC), Allen Larar (NASA LaRC), Will McCarty (NASA GSFC), Stefano Migliorini (ECMWF and NCEO, Univ. of Reading), Joe Taylor (SSEC/UW-Madison), David Tobin (CIMSS/SSEC/UW-Madison), Peng Zhang (NSMC/CMA), and Dan Zhou (NASA LaRC)*

This working group focuses on scientific issues affecting the optimal performance of advanced satellite sounder systems. The working group reviews the status of the development of advanced sounder systems and recommends changes pertaining to instrument specification, performance, data processing, and utilisation. For the purpose of this group, “Advanced Sounders” are defined as instruments that present significant new scientific and technological challenges and which require new methods for data processing and utilization. Thus, Advanced Sounders currently include high spectral/spatial resolution passive infrared and microwave sounders and active sensors.

## **Recommendation AS-1 to CGMS**

**To work with operational meteorological agencies to devise a plan to fill gaps in geostationary coverage of hyperspectral infrared sounding data.**

### **Action AS-1**

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

**Closed (CGMS-42 and 43)**

## **Recommendation AS-2 to space agencies**

**Pursue the development of advanced microwave sounders for geostationary satellites and pursue a demonstration of this new technology from aircraft and/or satellite.**

### **Action AS-2**

**ITWG Co-Chairs** to present the recommendation of this group to relevant Space Agencies (e.g., NASA, ESA, JAXA).

**Closed (CGMS-42 and 43)**

## **Recommendation AS-4 to NWP Centres**

**Provide the results of a global nature run which has the highest possible (ideally at least 1-km) spatial resolution which can be used in simulation studies to determine the optimal trade-offs between instrument FOV size, spectral resolution, and spectral resolution for advance sounding from Polar orbit.**

## **Action AS-3**

**ITWG Co-Chairs** to present the concerns of this group to space agencies and operational satellite user agencies to form expert teams to conduct studies leading to the improved designs of next generation polar satellite atmospheric sounding instruments.

There have been extensive discussions with Mitch Goldberg regarding this issue and science and engineering studies have been done and are ongoing to address this issue. On the science side, recent studies using simultaneous 2-km Global Hawk SHIS hyperspectral sounding data and dropsonde data show that a significant number of accurate soundings to the surface can be obtained within in the eye and in the broken cloud vicinity of hurricanes with 2-km resolution radiance data that could not be obtained with IASI and CrIS data.

**CLOSED**

## **Recommendation AS-6 to EUMETSAT and CNES**

**Re-evaluate the current design priorities for the IASI-NG considering the noise floor limiting the utility of these data posed by FOV size related cloud contamination and atmospheric and forward model noise.**

## **Action AS-4**

**ITWG Co-Chairs** to present the recommendation of this group to NASA/NOAA and EUMETSAT/CNES.

**CLOSED with CGMS**

## **Action AS-5**

**Groups interested in high-resolution nature runs to request existing nature runs from ECMWF and NASA GMAO, and to work with these and other NWP centers to create a global high (ideally towards 1-km) resolution nature run that can be used to develop the specifications for next generation satellite sounding instruments.**

**OPEN. Closed at next meeting with feedback?**

**Provide, in addition to the CrIS 399 channel subset of apodized radiances, either a set of reconstructed apodized radiances or a set of PC scores for a given set of leading PCs used to reconstruct the radiances. Also consider the provision of either a set of unapodised radiances or a (smaller?) set of reconstructed unapodised radiances along with the corresponding leading PCs used to compute them.**

## **Action AS-6**

**Advanced Sounders Working Group Co-Chairs** to present the concern of this group to ITWG users of CrIS data.

These concerns have been expressed but unfortunately without much positive response. For example, NOAA uses only 84 Hamming apodized CrIS radiances in their NWP operation and show that they get little, if any benefit, from assimilating them.

**CLOSED?**

## **Recommendation AS-8 to space agencies**

**Investigate the use of new MW technology to enable future MW sounding instruments to possess a field of view size which is closer to that provided by hyperspectral infrared sounders and the spatial resolution expected for future global NWP models, without compromising the noise performance.**

## **Action AS-7**

**ITWG Co-Chairs** to convey the need for higher spatial resolution MW measurements for utilization with future polar satellite hyperspectral radiances in the presence of clouds and to better approximate the resolution of future global NWP models.

**CLOSED (CGMS-42 and 43)**

# Advanced Sounder Working Group Meeting

Saturday 31 October

09:00 – 12:30