REPORT FROM WORKING GROUP III:
AMV HEIGHT ASSIGNMENT

Chairpersons: Iliana Genkova[1], Régis Borde[2]

[1]Co-operative Institute for Meteorological Satellite Studies, Madison, USA

[2]EUMETSAT, Darmstadt, Germany

This working group reviewed the progress made in AMV height assignment research; the results presented in the session III of this workshop, and also examined recommendations from CGMS 34 and 35. Finally, it made some recommendations to CGMS based on recent developments in this field.

Participants: Roger Davies, Kris Bedka, Richard Dworak, Jamie Daniels, Greg Dew, Claire Delsol, Eun Ha Sohn, Mary Forsythe (part time), Arthur De Smet (part time), Ryo Oyama (part time), Regis Borde (co-chair), Iliana Genkova (co-chair),

Discussion highlights and recognised achievements since the 8th International Winds Workshop

A couple of interesting papers have been published recently that relate to AMV techniques. The WG-3 discussed the most recent of them presented during the 9IWW:

1. Addressing CGMS recommendation 35.11, Chris Velden and Kris Bedka identified the uncertainty in determining satellite-derived HA, and proposed to consider AMVs as a layer in assimilation process

2. Regis Borde and Ryo Oyama proposed a new pixel selection methodology to keep a close link between feature tracking and HA of operational AMVs.

3. Following CGMS recommendations 34.14 and 35.08, Genevieve Seze et al. presented results from a AMV HA comparison against A-train CALIOP instrument. It recognised best agreement with CALIPSO for AMV heights for low level, inversion correction and cloud base HAM. These findings will be written into a paper and possibly used for developing a flag reporting which AMV HAM are most reliable for data assimilation purposes. (See Seze&Borde presentation)

4. Based on results and conclusions from the 8IWW, the clustering process of several HA algorithms have been changed, i.e. EUMETSAT (De Smet) and JMA (Oyama et al.).

5. Following CGMS recommendations 34.14 and 35.07, the results from a global AMV retrieval algorithms inter-comparison between producers have been presented (Genkova et. al.)

6. It was recognized that it is important to separate errors from tracking and HA in assimilation process. Work by Mary Forsythe and Roger Sounders illustrated the idea.

7. HA for polar AMV derived from AVHRR was reported as problematic at times, because the coldest pixels in a target often are not the clouds, but the ice surface instead. Comparisons with MISR (when available) may help assessing the errors in AMV altitudes due to such circumstances.

Major part of the discussion was dedicated on how to add up-to-date cloud type/analysis info into the AMV product development, i.e. EUMETSAT is using cloud analysis (CLA) product, CIMSS/NESDIS could use Geocat cloud product info in the future, Now-casting SAF cloud type could be used by other AMV producers, and so on. Cloud phase and vertical cloud development could be deduced from such products for more stringent test of the quality of the target before derivation of AMV.

RECOMMENDATIONS FROM WORKING GROUP WG-III

The three most significant recommendations were, in no particular order:

1. Work toward derivation of ΔH_error (AMV Producers and collaborating cloud teams); AND ΔH_layer (K.Bedka, C.Velden, J-G. Pereda,); Evaluate/Stratify by cloud properties and AMV characteristics and communicate with NWP for guidance (Met Office, ECMWF).

2. Need for independent height and wind error estimates. Define what input may be used. Report ΔU/V from intermediate (sub-vector/ displacement) AMV as a first step, more elaborate error may be developed at individual AMV centers.

3. Test the use of individual pixel contribution as a pixel selection process for HA (Borde and Oyama; Oyama et al.).

The following recommendations were deemed important, in no particular order:

4. Run new date case, (CGMS study), extract on a grid, estimate height from same target/search box size as well as “as is” in operational algorithm; Report target albedo/BT; only with ECMWF forecast; 10.8microns only; (CIMSS/NESDIS)

5. Recognised AMV heights in best agreement with Calipso; (best - low level, inversion correction and cloud base HA method); write up a paper/report; when possible ‘prescribe’ which AMV HA method are most reliable; (R.Borde, G.Seze)

6. Suggest adding most up-to-date cloud type/analysis info into the AMV product (i.e. new EUMETSAT CLA product, Geocat cloud product info, Now-casting SAF cloud type); (all AMV producers).

7. More stringent tests before derivation of vector: cloud phase, check change of vertical development, to extent possible use channels that all have on their satellites – OK! Re-evaluate thresholds related to possible vertical development ; Optimise use of Cloud phase and Cloud mask for HA purposes

8. Similarity of MISR winds, i.e. bias not due to height assignment: stratify MISR by cloud type for better comparison – It would be good if more MISR data studies are performed – use ECMWF first guess, stratification by cloud type.