REPORT OF THE CHAIRPERSONS OF SESSION III: Characteristics (Quality control, Height Assignment) and Validation

Chairpersons: Régis Borde and Chris Velden

In Session III on 'AMV Characteristics and Validation', ten papers covering various critical aspects of Atmospheric Motion Vector (AMV) extraction schemes, quality control, height assignments, and validation were presented.

The first paper by C. Payant (Meteo-France CNRM) presented a study on the quality control of winds from Meteosat 8. AMVs from Meteosat 8 were compared to winds from the global model Arpege with respect to different parameters such as pressure level heights, channels, and the Quality Indicator.

The second paper by J. LeMarshall (presented by J. Daniels) covered several topics: 1) The error characterization and the use of AMVs at JCSDA. The Expected Error (EE), Correlated Length Scale, and Correlated Error (CE) have been computed for several instruments (GOES 9, GOES 10, GOES 12, AQUA, TERRA and GMS 5), 2) Assimilation of MODIS winds into the NCEP global model indicates a positive impact in both hemispheres and the tropics, 3) Benefits of Windsat data assimilation in NCEP GDAS has been assessed.

H. Berger presented new quality indicators for GOES derived winds, and their potential effect on NWP data. The EE (multiple linear regression of AMV – RAOB difference) indices were compared with QIs and shown to provide a better relationship with actual AMV errors. He also presented first results of GOES AMV CE.

J. Gustafsson gave some views on AMV processing at EUMETSAT, focusing on the limitations of the validation process. The time period used for collocations with radiosondes (or aircraft observations) needs to be very long to be representative. One month is probably not enough. He also discussed the problems associated with the separation of the various sources of error, and to the averaging of several AMVs to get a final AMV product.

L. Machado showed the AMVs produced operationally at CPTEC/Brazil. CPTEC uses IR, WV and visible to produce AMVs each 30 minutes. The presentation also introduced the operational product – ForTraCC (FORecasting and TRAcking of the evolution of Cloud Clusters) used to describe the convective systems life cycle and its nowcasting. The relationship between convective system area expansion, at the initiation stage, and the life cycle duration allows this parameter to be used as a tool for nowcasting.

G. Dew described the introduction of the Recursive Filter Function (RFF), used by NOAA/NESDIS, as an Automatic Quality Control in the MSG MPEF environment at EUMETSAT. This constitutes a response to a CGMS meeting action deciding that all data producers should implement both the RFF and QI methods. The current status of the RFF implementation, preliminary indications of its impact, and the perceived way forward were presented.

J. Daniels presented a characterization of tracer height assignment errors. GOES AMVs have been compared against wind profiler and radiosonde wind profiles. Results for CO2 heights, H2O intercept heights and IR window heights were discussed together with the use of a radiance bias correction for channel 11 and 13.3 μm. It was also suggested, based on recent work by C. Velden, to associate AMVs heights to a layer, since it better represents the features resulting from the tracking process.

A. De Smet showed and discussed the merits of the CO2 height assignment method. The CO2 method applying the IR-12.0 channel, which is the primary operational Meteosat-8 height assignment method, yields more consistent results than the one applying the IR-10.8 channel. It was shown, however, that the CO2 method is in general very sensitive to the nearby cloud-free radiance used in the calculation. When no cloud-free pixels are available, the CO2 method will rely on predicted values for the cloud-free radiance. These may result in poor CO2 heights.

R. Borde proposed a new clustering approach for the height assignment methods used at EUMETSAT. It is mainly based on the use of several percentages of coldest cloudy pixels inside the target area. Pixels selected by the clustering method correspond better to the pixels that are being tracked. He showed the benefits of this approach, especially concerning the consistency of all the height assignment methods implemented at EUMETSAT.

Mary Forsythe gave an overview of recent developments in regards to the NWP SAF AMV monitoring, including examples from an analysis report highlighting how the O-B monitoring can be used to learn more about the AMV errors. She also showed some early results from comparisons of AMV pressure with model best-fit pressure.

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