# REPORT FROM WORKING GROUP II:
# AMV Data Assimilation

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The Data Assimilation Working Group discussed several of the pertinent CGMS actions as well as a number of separate issues of relevance to the international collaboration on improving the use of satellite winds for data assimilation and numerical weather predictions.

It was noted that the impact of satellite winds is positive in almost all systems, for all regions, all predicted variables and at all time scales. However, it was also noted that considerable room for improvement exists in the areas of height assignment and quality control/data selection, and a number of specific recommendations were put forth. There was general agreement that height assignment is still the main source of error in the AMV data processing chain, especially in regions of high wind shear. In this context, the working group agreed, that separate estimates of height in [hPa], U and V in [m/sec] errors should be provided, along with estimates of the total error. It was also stressed out, that error estimates should be, if possible, physically rather than statistically based.

Another potentially useful item of information is the provision of an estimate of the vertical layer for which the wind vector is representative, so that a suitable layer thickness may be assigned through the NWP observation operator. It was noted that CIMSS might be willing to provide quantitative information about representative vertical layer for each AMV for a test period and that the Met Office then could provide preliminary assessments of innovation statistics for these test data set. It was furthermore recommended that the possibility of using corrected observed temperature rather than assigned pressure to identify the appropriate vertical model level for the AMV wind vector should be tested.

One frequently raised concern about the use of satellite winds for NWP is that the data is affected by spatially and temporally correlated errors that when not accounted for can have a substantial negative impact on forecast quality. Since most data assimilation systems cannot account for horizontal observation error correlations, data thinning is a widely used alternative. The working group discussed this issue intensively and encouraged the data assimilation community to develop methods to explicitly account for observation error correlation in their systems. It was also recognized that observation error covariances are in need of renewed estimation as both the global observing system and typical model resolutions have changed since the original work by Borman et al. substantially.

The use of model-simulated imagery as a tool for studying and improving the performance of product generation and data assimilation systems was strongly endorsed, and it was pointed out that these data have potential applications also in the assessment of future candidate observing systems such as hyperspectral infrared sounders in geostationary orbit. The workshop recommended that this work be continued and extended to higher horizontal resolution using limited area non-

hydrostatic models together with highly resolved global models for the same date in order to compare the results.

Finally, the Workshop recognized the importance of other (non feature-tracking) types of satellite wind observations. Data assimilation testing of the Lidar wind observations to be obtained from ESA's ADM/Aeolus mission was encouraged and future work toward exploring this measurement technique also for operational use was strongly recommended. The prospects of obtaining real-time access to ISCAT data was greeted with enthusiasm.