**INVESTIGATIONS ON ALTERNATIVE INTERPRETATION OF AMVS**

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Abstract

Atmospheric motion vectors (AMVs) are typically interpreted as single level point estimates of wind at the assigned height. Cloud-top is assumed to be a representative height for high and mid-level clouds and cloud base for low level clouds, respectively. However, comparison to radiosonde and lidar observations as well as investigations in a simulation framework indicate some benefits from interpreting AMVs as layer averages, or as single-level wind estimates but within the cloud.

Alternative interpretations of AMVs are tested in the ECMWF system and the results will be reported in the presentation. A traditional single-level observation operator is currently used in the operational ECMWF system. A novel observation operator could interpret an AMV as a layer average. Averaging below the observation height is a realistic approach if the assigned height represents the cloud-top height. On the other hand, if the assigned height is interpreted as representative level, centred averaging would be more justifiable. One possible approach is also re-assigning the observation height. Model best-fit pressure bias statistics can provide some guidance for the re-assigning or positioning of the layer average.

Single observation experiments reveal how information from AMVs is spread in vertical. Layer averaging spreads the observation information more in vertical than a single-level observation operator. The choice where the layer is positioned determines where the maximum analysis increment is located. Thus, it is evident that the choice of the observation operator will have an impact on the resulting analysis and consequently on the forecasts.