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Comparison of Cloud Top Height products to set the altitude of Atmospheric Motion Vectors derived from MSG images.

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Atmospheric Motion Vectors (AMVs) are one of the most important products derived from all geostationary satellites, because they constitute an important part of the observation data provided to Numerical Weather Prediction models. The altitudes of the estimated motion vectors are set using the Could Top Heights (CTH) calculated on a pixel basis for all the cloudy pixels in Meteosat images. Various techniques are used at EUMETSAT to calculate the CTH as a function of cloud type. Infrared brightness temperatures are used to retrieve the CTH of opaque clouds and a semi-transparency correction is applied for cirrus and other semi-transparent clouds using the CO2 slicing method. However, a new meteorological product (Optimal Cloud Analysis, OCA) is currently being developed at EUMETSAT based on optimal estimation. The OCA algorithm retrieves cloud micro-physical and bulk properties from SEVIRI observations: Optical Thickness, Effective Particle Radius, Cloud Top Temperature, Cloud Top Pressure, and Cloud Phase. It differs in substance from the standard EUMETSAT method in using visible channels (daytime only) and all infrared channels simultaneously, giving an overconstrained system which allows detection of difficult scenes (e.g. multi-layer cloud) which can then be eliminated. It is hoped that the OCA pixel based CTH with it's robust quality control information might improve the reliability of the AMV height assignment. Performances of AMV product have been tested for 12:00 UTC images for the whole month of August 2006 at setting the altitude using the classical CTH product and the new OCA product respectively. This presentation summarizes the main results of this comparison, showing respectively the speed biases, RMS and best-fit pressures estimated against the collocated forecast fields.