



Atmospheric Motion Vectors Climate Data Records derived from Meteosat and Metop satellites

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Within the Copernicus Climate Change Service (C3S), EUMETSAT has generated Climate Data Records (CDRs) for Atmospheric Motion Vectors (AMVs). AMVs are derived from consecutive satellite images by identifying the displacements of cloud or water vapour structures, depending on the channel used for the measurement, retrieving a speed and direction. Assigning the correct height for the detected vectors is one of the main sources of uncertainty. A Quality Indicator (QI) provides an estimation of the quality of each single retrieval from consistency checks against other nearby wind vectors and comparisons to model wind fields.

The presentation will show AMV CDRs derived from Meteosat satellite data located at 0° latitude and over the Indian Ocean as well as an AMV CDR derived from AVHRR data from the Metop-A and B satellites being in polar orbit. Due to the long time series of Meteosat measurements and global coverage achieved using AVHRR measurements from two Metop satellites together, AMVs represent an important wind information for global Numerical Weather Prediction (NWP) re-analysis as well as a possible indicator for climate change studies. EUMETSAT AMV CDRs have and will be assimilated for global re-analysis, e.g. the future 6th European Re-Analysis (ERA6) at the European Centre for Medium range Weather Forecast (ECMWF).

AMV CDRs are produced aiming at a homogeneous as possible time series. Meteosat time series are almost 40 years long and Metop time series approach 15 years. Number of spectral channels and instrument characteristics have changed over such long time spans. To arrive at a homogeneous record only spectral channels are used that are common to all instruments in a time series. Such long homogeneous data records are suitable for data assimilation and climate studies. The AMV CDRs have been validated against radiosondes, reanalysis data from Numerical Weather Prediction (NWP) models and operational near real time satellite products.

We will present the C3S AMV CDRs, their quality and show their potential for climate application. First results from a potential application of those CDRs to monitor climate change by an analysis of the position of the jet stream will be included.