Geophysical Research Abstracts
Vol. 19, EGU2017-7506, 2017
EGU General Assembly 2017

Inter-comparison of the EUMETSAT H-SAF and NASA PPS precipitation products over Western Europe.

Chris Kidd (1,2), Giulia Panegrossi (3), Sarah Ringerud (1,4), and Erich Stocker (1)

(1) NASA/Goddard Space Flight Center, Greenbelt, USA (chris.kidd@nasa.gov), (2) University of Maryland, College Park, USA, (3) Institute of Atmospheric Sciences and Climate - National Research Council, Rome, Italy, (4) Universities Space Research Association, USA

The development of precipitation retrieval techniques utilising passive microwave satellite observations has achieved a good degree of maturity through the use of physically-based schemes. The DMSP Special Sensor Microwave Imager/Sounder (SSMIS) has been the mainstay of passive microwave observations over the last 13 years forming the basis of many satellite precipitation products, including NASA's Precipitation Processing System (PPS) and EUMETSAT's Hydrological Satellite Application Facility (H-SAF). The NASA PPS product utilises the Goddard Profiling (GPROF; currently 2014v2-0) retrieval scheme that provides a physically consistent retrieval scheme through the use of coincident active/passive microwave retrievals from the Global Precipitation Measurement (GPM) mission core satellite. The GPM combined algorithm retrieves hydrometeor profiles optimized for consistency with both Dual-frequency Precipitation Radar (DPR) and GPM Microwave Imager (GMI); these profiles form the basis of the GPROF database which can be utilized for any constellation radiometer within the framework a Bayesian retrieval scheme. The H-SAF product (PR-OBS-1 v1.7) is based on a physically-based Bayesian technique where the a priori information is provided by a Cloud Dynamic Radiation Database (CDRD). Meteorological parameter constraints, derived from synthetic dynamical-thermodynamical-hydrological meteorological profile variables, are used in conjunction with multi-hydrometeor microphysical profiles and multispectral PMW brightness temperature vectors into a specialized a priori knowledge database underpinning and guiding the algorithm's Bayesian retrieval solver.

This paper will present the results of an inter-comparison of the NASA PPS GPROF and EUMETSAT H-SAF PR-OBS-1 products over Western Europe for the period from 1 January 2015 through 31 December 2016. Surface radar is derived from the UKMO-derived Nimrod European radar product, available at 15 minute/5 km resolution. Initial results show that overall the correlations between the two satellite precipitation products and surface radar precipitation estimates are similar, particularly for cases where there is extensive precipitation; however, the H-SAF tends to have poorer correlations in situations where rain is light or limited in extent. Similarly, RMSEs for the GPROF scheme tend to a smaller than those of the H-SAF retrievals. The difference in the performance can be traced to the identification of precipitation; the GPROF2014v2-0 scheme overestimates the occurrence and extent of the precipitation, generating a significant amount of light precipitation. The H-SAF scheme has a lower precipitation threshold of about 0.25 mmh-1 while overestimating moderate and higher precipitation intensities.