

SATELLITE DERIVED PRECIPITATING PRODUCTS BASED ON A PRINCIPAL COMPONENT ANALYSIS

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ABSTRACT- Convective Rainfall Rate from Cloud Physical Properties (**CRRPh**) and Precipitating Clouds based on Cloud Physical Properties (**PCPh**) are satellite derived rainfall products based on the MSG/SEVIRI channels and on the cloud top microphysical properties. Both rainfall products have been developed within the Nowcasting Satellite Application Facility (NWC SAF) context to provide instantaneous rain rates, hourly accumulations associated to convective episodes and the probability of precipitation occurrence respectively.

New prototypes of the CRRPh and the PCPh have been developed, both based on a principal component analysis (PCA). 5 MSG/SEVIRI infrared channels, 1 visible, 2 water vapour channels and the cloud water path (CWP) have been used in the new algorithms.

The new prototypes introduce a concept of continuity and completeness by using the same inputs during the whole day. Since the 0.6 μ m Visible channel and the Cloud Water Path (CWP = 2/3 COT * REFF) derived from CMIC are only available at day time, it is necessary to create a pseudo-VIS06 and a pseudo-CWP to be used at night time. This simulation is also based on a Principal Component Analysis.

Encouraging results have been obtained, which improve the latest version of NWC geostationary precipitating products particularly at night time.

CRRPh has been calibrated in the Iberian Peninsula and validated against the Spanish radar composite. The validation has been extended to the European area using the OPERA network. CRR and the new CRRPh prototype performance have been tested in different convective events. Validation results will be shown.

KEYWORDS – Principal component analysis (PCA), Convective Rainfall Rate from Cloud Physical properties (CRRPh), Precipitating Clouds based on Cloud Physical Properties (PCPh), water vapor, infrared, visible, MSG/SEVIRI, OPERA, Validation.