A comparison of the First View of GPM with Ground Radar and NWCSAF CRPh over Continental Spain

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The first, preliminary, data from the Global Precipitation Measurement Core Satellite illustrate the potential of this spacecraft for science and societal applications. Here we show a glimpse on the first overpasses over Spain. The DPR measurements and the GMI estimates area qualitatively compared with Ground Radar (GR) measurements from the National Radar Network of Spain (PPI); with EUMESAT NWCSAF Convective Rainfall Rate from Cloud Physical Properties (CRPh, based on VIS and IR: day-only product); and with Meteosat imagery (HRV and 10.8 µm IR channels from MSG). Notwithstanding the provisional character of the data and all the applicable caveats and disclaimers, both the GPM radar and the radiometer provide precipitation estimates that are remarkably close to ground radar observations. This is specially noticeable for the GMI, as the estimates used here come from the original, day-1 database. Also CRPh product shows a good behavior in all cases. The adequacy of using GPM data to calibrate/validate the NWCSAF CRPh product is being studied.

JULY 2, 2014 @ 1530 UTC









GEOPOTENTIAL and TEMPERATURE at 500 hPa

GEOPOTENTIAL and TEMPERATURE at 250 hPa







SYNOPTICAL ANALYSIS: A low spreads south from the north west of Spain. During the day instability develops due to the advection of steep lapse rates from the inland of Spain as well as by diurnal heating of the lower layers. Developing of convection leads into two main clusters: a highly dynamical one with strong vertical shear over the east of the peninsula and a less severe cluster under the trough in height.

*The CRPh (Convective Rainfall Rate from Cloud Physical Properties) product is a Nowcasting tool that provides an estimation of the instantaneous rain rates associated to convective clouds in a MSG pixel basis. This product, included in the EUMETSAT NWCSAF software package, uses an algorithm based on the cloud top physical properties and is derived only for day time. Effective Radius, Condensed Water Path and phase information on the cloud tops are the inputs used by this product that has been calibrated using data from the Radar Network of Spain.

Marcos, C., Rodríguez, A., 2013. Algorithm Theoretical Basis Document for "Precipitation products from Cloud Physical Properties" (PPh-PGE14: PCPh v1.0 & CRPh v1.0). Available at www.nwcsaf.org

APRIL 21, 2014 @ 1230 UTC



MSG SEVIRI IR 10.8 μm





GPM DPR





SYNOPTICAL ANALYSIS: A wide trough resides over the Iberian Peninsula with a frontal system crossing it. Local vorticity maxima at mid and high levels lead to several relative lows at surface level. Diurnal heating of the lower layers triggers the development of several strong precipitation nuclei throughout the peninsula.

Fisheries not covered by ground radars



NWCSAF CRPh



Rain outside GR range



Surface rain here therefore differs from GR estimate





885 km swath width, from NE Spain (Catalonia) to SW Spain (Andalusia): the case for the radiometer

APRIL 24, 2014 @ 1130 UTC



GEOPOTENTIAL and **GEOPOTENTIAL** and **COLUMN WATER and WIND at TEMPERATURE at 500 hPa TEMPERATURE at 850 hPa** 850 hPa









SYNOPTICAL ANALYSIS: An intense digging trough is crossing the Iberian Peninsula from the north and spreads east in the noon and afternoon hours. Ahead of the trough, a strong south-westerly jet spreads east. Diurnal heating leads to steep lapse rates especially at low levels. Differential cyclonic vorticity advection and WAA assist in numerous storms that merge into larger clusters.







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