



## Data assimilation for short-range solar radiation forecasts

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Solar panels and solar power plants are getting increasingly more popular. The amount of energy that can be obtained from solar power systems depends on incoming solar radiation, which in turn is highly related to the meteorological conditions, in particular clouds. In order to obtain better solar radiation forecasts, satellite data products has been used for cloud initialization in combination with variational data assimilation of raw radiances. The work was done within the EU FP7 research project DNICast (Direct Normal Irradiance Nowcasting methods for optimized the operation of concentrating solar technologies).

The HARMONIE-AROME km-scale forecasting system has been used to provide short-range forecasts of cloudiness, Global Horizontal Irradiation (GHI) and Direct Normal Irradiation (DNI). The impact of utilizing different data assimilation and initialisation methods have been investigated as well as the sensitivity to the use of satellite data in various forms. The studies so far has been carried out over a Southern-European domain using cloud products from the EUMETSAT nowcasting satellite application facility (NWC SAF) and raw radiances from the Spinning Enhanced Visible and InfraRed Imager (SEVIRI) onboard the geostationary Meteosat Second Generation (MSG) satellites. The future plan is to adopt our studies to a North-European domain where a combination of data from geostationary and polar orbiting satellites is necessary to obtain good coverage. Furthermore, the benefits from using an ensemble system for this application will be investigated.

Encouraging results regarding the use of cloud initialization for short-range cloud forecasts will be shown for Southern-Europe, although needs for further improvements regarding the procedure applied are identified. As expected, the use of data from the SEVIRI instrument proved to be beneficial for data assimilation over this Southern domain where the geostationary MSG has good coverage and resolution.