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Evaluation of ground measured solar radiation from MSG solar channels radiances in cloudy days.

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Mapping solar radiation at Earth surface from geostationary satellites data is a relatively well known topic in conditions of clear skies. But, even in southern European latitudes, cloudiness has a strong effect in modulation of incoming solar radiation affecting production of solar energy. This paper is a detailed study about the evolution of ground based measurements: global, direct and diffuse solar irradiances at several sites in Iberian Peninsula and a distilled set of radiances from SEVIRI solar channels (on board Meteosat Second Generation). Satellite radiances dataset is calculated by spatial averaging over the ground sites and ground solar radiances are also time averaged from original minute data. An analysis of synoptic situation and a cloud characterization using Nowcasting Satellite Applications Facility (NWC SAF) cloud products provide the framework to insert comparisons between both data sets.

Two days from October 2006 have been selected and ten ground observatories mainly at Iberian central plateaus provide ground data. Temporal and spatial evolution according different parts of a synoptic weather system and different types of clouds are shown as a first step towards algorithms that allow mapping solar radiation over Iberian Peninsula from satellite irradiances combined with ground based radiometers.

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Keywords

Solar radiation, MSG, global radiation, direct radiation, diffuse radiation.