Comparing sky-camera vs satellite solar radiation nowcasts

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Nowcasting the solar radiations is important area of research in solar energy. Accurate solar nowcasts can improve the efficiency and dispatchability of Solar Thermal Electricity (STE) plants as well as help Photovoltaic (PV) plants to deal with short term fluctuations causing ramps and to optimize the management and size of the storage systems. Solar radiation nowcasts can be obtained based on sky cameras. Nevertheless, the maximum time horizon of these forecasts is, typically, about 15 minutes. Solar nowcasts can be also derived from Cloud Motion Vectors (CMV) based on Meteosat Second Generation (MSG) images. Nevertheless, the minimum time horizon of these forecasts is about 15 minutes. On the other hand, the maximum lead time for valuable satellite forecasts extend several hours. So far, scarce comparative analyses between both methods of nowcasting have been conducted. In this work we present preliminary results of the comparison of sky camera and satellite DNI and GHI nowcasts in the southern Iberian Peninsula. A set of 3 sky cameras is used to provide one-hour-ahead one-minute-resolution forecasts. Evaluation station is located about 4 km downstream from the sky camera set. High resolution (1 km) one minute resolution satellite nowcasts were also obtained and compared against the sky camera forecasts. The study is conducted for a set of days covering different sky conditions and cloud types. Results showed that the sky camera provides more accurate forecasts that the satellite for certain types of clouds and up to 30 minutes leading times. But results greatly vary according to the sky conditions and lead time.