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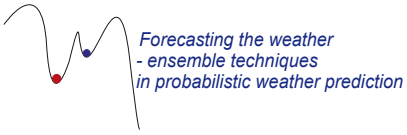

Experiences with MOS technique applied to a solar radiation forecast system.

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Power generation from solar systems is characterized by its intermittency, which has an irregular part due to meteorological conditions. An efficient management of solar energy in the electrical grid requires reliable forecasts. During the last years a strong effort has been done to make production forecasts useful for end-user, calculating the radiative components more functional to different typologies, as direct normal irradiation for concentration system and global radiation for photovoltaic ones.

At RSE we have developed and tested a system to forecast hourly 3-day ahead global, diffuse and direct normal irradiation on the Italian country. This system is based on a diagnostic radiative transfer model (RTM) which can run using vertical profiles of pressure, temperature, humidity, liquid and ice water content and fractional cloud cover provided by any Numerical Weather Prediction (NWP) model, as, for example, COSMO or RAMS. Any RTM is very sensitive to atmospheric fractional cloud cover and liquid/ice cloud content, and many works have been performed to better describe these variables by the NWP models. The RTM implemented adopts a maximum-random overlap criterion to weigh the clear and cloudy radiative components, and besides using the own NWP fractional cloud cover, others cloud schemes based on relative humidity have been analyzed.

A Model Output Statistic (MOS) correction has been performed to reduce errors, especially for the diffuse component which is systematically underestimated by the radiative scheme adopted. MOS is based on ground radiative measurements from three sites and some model variables used as predictors. The major improvements using MOS are obtained for those configurations characterized by systematic forecast faults, due to either in the cloud representation or in the radiative scheme.