



## **Evaluation of the MM5 solar radiation estimates in southeastern Spain**

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The solar radiation plays a major role in the energy exchange process between the atmosphere and the earth surface and is, therefore, a key parameter in a wide range of studies related to agriculture, hydrology, ecosystem modeling or renewable energy. Particularly, the development that solar energy (both thermal and photovoltaic) will have in Spain along the next years needs for a reliable and promptly available estimation of the available solar energy resources. Mesoscale meteorological models, as the PSU/NCAR model (known as MM5) has been widely employed in order to simulate or predict mesoscale atmospheric circulation and, then, climate variables. In this work we analyze the reliability of solar radiation estimates provided by the MM5 and its dependence on the topography. Particularly, global horizontal solar radiation values for clear-sky days were obtained based on several integrations. The experiments were carried out for several locations in southeastern Spain, representatives of a wide variability of topographic and climatological conditions. The estimates were tested against experimental data. Results show, overall, that the MM5 estimates reasonably resemble the experimental data in flat homogenous areas. Nevertheless, when increasing the topographic complexity, estimates strongly differ from the experimental data.