Geophysical Research Abstracts
Vol. 16, EGU2014-9483, 2014
EGU General Assembly 2014

On the ability of two regional climate models to simulate surface solar radiation patterns over Europe: An assessment using CM SAF satellite data

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In this work, an assessment of the ability of WRFv3.3.1 and RegCM4 regional climate models to simulate the surface solar radiation (SSR) patterns over Europe is presented. A 20-years (1990- 2009) simulation with WRF with a spin-up of one year is used. On the other hand, the REGCM4 simulation, which was implemented within QUADIEEMS project, spans from 2000 to 2010. Both WRF and RegCM4 regional climate simulations were driven by ERA-interim and the horizontal resolution is 50km. The model derived annual and seasonal SSR patterns are compared with satellite data from the Satellite Application Facility on Climate Monitoring (CM SAF) (www.cmsaf.eu). The satellite dataset spans from 1983 to 2005 having a spatial resolution of 0.03 degrees. The Pearson's correlation coefficient, the root mean square error, the normalized standard deviation and the modified normalized mean bias are among the metrics used for the evaluation of the WRF and RegCM4 monthly SSR values against the corresponding CM SAF observations. Overall, the potential of using well established satellite products in validating SSR climate model simulations is highlighted here. This research is funded by QUADIEEMS project which is co-financed by the European Social Fund (ESF) and national resources under the operational programme Education and Lifelong Learning (EdLL) within the framework of the Action "Supporting Postdoctoral Researchers".