EMS Annual Meeting Abstracts
Vol. 9, EMS2012-95, 2012
12th EMS / 9th ECAC

Sensitivity of the RMI enhanced version of the Heliosat method to various ancillary input data

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Appropriate information on solar resources is very important for a variety of technological areas, such as: agriculture, meteorology, forestry engineering, water resources and in particular in the designing and sizing of solar energy systems. Solar radiation is observed by means of networks of meteorological stations. Costs for installation and maintenance of such networks are very high and national networks comprise only few stations. Consequently the availability of observed solar radiation measurements has proven to be spatially and temporally inadequate for many applications. Hopefully, several authors have shown the potentialities of retrieving solar surface irradiance (SSI) from satellite data. Based on these findings an enhanced version of the Heliosat method has been implemented at the Royal Meteorological Institute of Belgium to estimate SSI over the Benelux countries from Meteosat Second Generation at the SEVIRI spatial and temporal resolution.
In this contribution, the sensitivity of our retrieval scheme to various sources of surface albedo, atmospheric aerosol and Total Precipitable Water Content (TPWC) input is discussed.
The results analysis indicates that while the use of dynamical information for these 3 parameters instead of climatological values can help to reduce in some extend the RMS error between satellite retrieved and ground measured SSI, the benefit vanishes when merging satellite retrieval and ground based values.