Applying the Heliosat-4 method to three different cloud properties databases for the estimation of the surface downwelling shortwave irradiance

Centre O.I.E.
Observation, Impacts, Energie
(Sophia Antipolis, France)

AUTHORS
Mireille Lefèvre
Sylvain Cros
Yves-Marie Saint-Drenan
Jan Fokke Meirink
Marion Schroeder-Homscheidt
Hartwig Deneke
Mathieu Turpin
Martin Stengel

PARTNERS

CONTACT
mireille.lefevre@mines-paristech.fr
www.oie.mines-paristech.fr

Year 2016: a CAMS-RAD anomaly in the Netherlands investigated with a comparison of different cloud properties databases

Impact on Heliosat-4 SW irradiance for 56 stations:

- SICLONE (NWC SAF)
- MSG-CPP (KNMI)
- APOLLO (DLR)

Distribution of Cloud Optical Depth (COD)

- Marked differences between the different datasets
- APOLLO is relatively non-discriminatory for the low COD mainly considered as null
- SICLONE presents a more uniform distribution of low COD

Sensitivity of HS-4 to the cloud properties for the 37 northern stations

- There is a clear sensitivity of HS-4 output product to the COD and CT from the different sources, and from their temporal evolution (APOLLO bias is unusually higher in 2016).

Conclusion
- Heliosat-4 method is simple to use and to implement with different databases of cloud properties
- There are significant differences among existing cloud properties databases that have a noticeable effect on SW irradiance from Heliosat-4
- This work demonstrated the relevance of inter-comparison of cloud properties databases

CONTACT
mireille.lefevre@mines-paristech.fr
www.oie.mines-paristech.fr

EMS – Copenhagen, Denmark (11/09/2019)