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Climatology of the aerosol distribution in the boundary layer for solar energy applications

The right assessment and predictability of energy yield are key factors to enhance the competitiveness of power plants driven by renewable energies. Atmospheric constituents, especially those with high temporal and spatial variability must be described as accurate as possible. Specifically for solar systems water vapor, clouds and aerosols have to be characterized.

This study aims to provide more insight about the capability of CALIPSO satellite data to be used for solar CSP plant assessment. Is it suitable to obtain information about the presence and vertical distribution of aerosols in the lowest part of the troposphere?

The path that the light follows from the source up to the system's receiver is mainly comprised by two trajectories: the first one from the top of the atmosphere up to the emitter (in general a reflective surface) and the next one from there up to the receiver. In the case of tower systems, the distance emitter-receiver is larger compared to that of other CSP technologies. For this reason tower systems are presumably more sensitive to the vertical distribution of aerosols

The content of the presented study includes the use of a dust-model to compare with datasets retrieved by CALIPSO satellite. Preliminary regional results and oncoming challenges are discussed.

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