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Vertical distribution of aerosols at regional and global scales for CSP applications: what satellite and numerical models provide

Efficiency and predictability of solar energy systems is impacted by several factors. Apart from the technological component, the meteorological conditions influence strongly the performance of the systems. These conditions affect in a different extent depending on the technology itself and the layout of the facility. Particularly for the case of CSP solar tower the contribution of aerosols in the lowest part of the atmosphere to the extinction of radiation (compared to other technologies) could be enhanced. For that reason the knowledge of the vertical distributions of aerosols might lead to both the improvement of accuracy of the yield forecasting and of a well-aimed choice of location during the early stages of plant's assessment. Nevertheless, the knowledge of that vertical structure is limited and faces still several challenges to be improved. From the currently available datasets, regional and global data from CALIPSO satellite and COSMO-MUSCAT and MACC(ECWF) models are used to describe the presence of aerosols in the lowest 300m of the atmosphere. Results and challenges are presented.