



Aerosol-cloud relations over Eastern Mediterranean as seen from MODIS satellite observations

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In this work, the aerosol-cloud relations over the region of Eastern Mediterranean are investigated at a spatial resolution of 0.1 degrees (~ 10 km). Within the QUADIEEMS project, a 13-year gridded dataset with several aerosol and cloud related parameters has been compiled using level-2 single pixel measurements from MODIS TERRA and MODIS AQUA satellite sensors. The aerosol gridded dataset has been successfully validated against ground-based measurements from 12 AERONET sites. The high spatial resolution of the dataset allows for the investigation of local phenomena. In addition, the combined use of MODIS data with data from the Earth Probe TOMS and OMI satellite sensors, data from the ERA-interim reanalysis, data from the GOCART chemical-aerosol-transport model and the MACC reanalysis, allows for the quantification of the relative contribution of different aerosol types to the total aerosol optical depth (AOD₅₅₀). Using these results, we calculate the relations of AOD₅₅₀ with the cloud effective particle radius, the cloud droplet number concentration, the cloud cover and the cloud water path. Further, we repeat this procedure taking into account each time days characterized by a dominant aerosol type (e.g. anthropogenic, dust) and different types of clouds (e.g. liquid, ice, low, high, etc). We present here selected results from this ongoing research. This work 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".