



MODIS Collection 6 aerosol patterns and trends over the greater Mediterranean region; evaluation and differences with Collection 5.1

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The most recent release of the MODIS (Moderate resolution Imaging Spectroradiometer) aerosol product is Collection 6 which replaced Collection 5.1. The core parameter of the MODIS aerosol product is the aerosol optical depth at 550 nm (AOD_{550}). AOD_{550} retrievals from the two MODIS sensors aboard the EOS Terra and Aqua satellites have been extensively used the last fifteen years to examine the sources, the variability of aerosols and the effect they exert on air quality and climate. Collection 6 is currently used in studies focusing on the greater Mediterranean region; however, an evaluation of the Collection 6 AOD_{550} dataset against ground-based observations and an assessment of its differences and similarities to the previous widely used Collection 5.1 is missing. In this work, we present a first comparison of the MODIS/Terra and Aqua Collection 6 and Collection 5.1 AOD_{550} data for the greater Mediterranean region (Georgoulas et al., 2016). It is shown here that Collection 6 AODs are either higher or lower than Collection 5.1 AODs over different continental areas. On the contrary, over the sea, Collection 6 AODs are higher almost everywhere (11% for MODIS/Terra and 8% for MODIS/Aqua). Collection 6 generally retrieves higher AODs than Collection 5.1, especially for MODIS/Terra. Collection 6 and 5.1 AOD_{550} data were evaluated against sunphotometric observations from 23 AERONET stations in the region. It is shown that Collection 6 exhibits a better agreement with the ground-based data than Collection 5.1. Our trend analysis shows that the Collection 6 AOD_{550} data exhibit a statistically significant negative trend of $\sim -0.001/\text{year}$ ($\sim -0.5\%/\text{year}$) for MODIS/Terra and $\sim -0.002/\text{year}$ ($\sim -1.0\%/\text{year}$) for MODIS/Aqua. Collection 6 AOD_{550} trends are largely reduced compared to Collection 5.1 trends by $\sim 0.003/\text{year}$ for MODIS/Terra. On the contrary, for MODIS/Aqua the trends have not changed significantly (only by $\sim 0.0003/\text{year}$).

*Georgoulas, A.K., Alexandri, G., Kourtidis, K.A., Lelieveld, J., Zanis, P., and Amiridis, V., Differences between the MODIS Collection 6 and 5.1 aerosol datasets over the greater Mediterranean region, *Atmospheric Environment*, 147, 310-319, doi:10.1016/j.atmosenv.2016.10.014, 2016.