



Global Aerosol Optical Thickness Trends from SeaWiFS, MODIS and MISR over Megacities

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Aside from adverse health effects urban aerosols can have significant impact on regional and potentially global climate. In this study Aerosol Optical Depth (AOD) retrievals over land are performed to study the medium to long-term trends of aerosols in largest urban agglomerations (aka megacities) to investigate recent changes related to potential "brightening" or "dimming" effects due to aerosols.

For this study, suitable instruments need to provide sufficiently long data records on a global scale. Space borne sensors can be an interesting choice but need excellent in-flight performance/calibration. Instruments meeting the objective to provide long, well-calibrated data records are SeaWiFS, MODIS-Terra/Aqua and MISR. As SeaWiFS does not provide reliable AOD retrievals operationally we have used the Bremen AErosol Retrieval (BAER) algorithm to retrieve AOD. For all others we have used L2 data and applied a modified linear long term trend analysis.

Here, AOD trends over several of the world's largest urban agglomerations have been studied using BAER based on SeaWiFS (SEA) data for one decade - from 1998 to 2007, and L2 data from MODIS-Terra (MOD) for 2000-2009, MISR (MIS) from 2000-2010 and MODIS-Aqua (MYD) (2003-2008). All comparisons are focussing on 550 nm. Trends have been gridded to $1^\circ \times 1^\circ$ except for MIS, where $0.5^\circ \times 0.5^\circ$ were used globally/regionally. Regional analysis is done for the eleven largest megacities (and the German Rhein-Ruhr-Region, assigned with "I").