



Variations of meridional aerosol distribution and solar dimming

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Meridional distribution of aerosol optical thickness (AOT) over the ocean was analyzed by using the eight-year MISR and MODIS-Terra data sets, from March 2000 to February 2008, as well as the five-year MODIS-Aqua data set, from July 2002 to June 2007. The three satellite sensors show that there was a pronounced meridional aerosol asymmetry. It was found that there were strong seasonal variations in the meridional aerosol asymmetry: it was most pronounced in the April – July months. There was no noticeable asymmetry during the season from September to December. The Northern hemisphere, where the main sources of natural and anthropogenic aerosols are located, contributed to the formation of noticeable aerosol asymmetry. During the season of pronounced hemispheric aerosol asymmetry, an increase in AOT was observed over the Northern hemisphere, while a decrease in AOT was observed over the Southern hemisphere. At mid-latitudes in the Northern hemisphere (30N – 60N), the main contribution to seasonal variations of AOT over the ocean was made by Pacific Ocean aerosols. At low latitudes in the Northern hemisphere (0N – 30N), aerosols over the Atlantic Ocean contributed to seasonal variations of AOT more significantly than aerosols over the Pacific Ocean. During the eight-year period under consideration, the brightening phenomenon, detected over the land, was not observed over the ocean at mid-latitudes 30N - 60N in cloudless conditions. This suggests that the solar dimming-brightening phenomenon is rather a local (regional) one, restricted to highly-populated and/or industrial zones.