



Seasonal Variations of Sharan Dust Transport over the Mediterranean Sea to Europe

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Saharan dust reaches Europe over the Mediterranean, and also by looping back over the Atlantic. Both transport paths exhibit seasonal dependence. We use monthly data of aerosol optical thickness (AOT) from the Moderate Resolution Imaging Spectroradiometer (MODIS) on board the NASA Terra and Aqua satellites for the ten-year period, 2000 - 2009 in order to determine this dependence. The local maxima of AOT are used to visualize the transport paths.

We find that dust transport over the Mediterranean is displaced westward from February to September, so the transport is over the eastern Mediterranean during spring, and over the western Mediterranean during Autumn. In Europe during spring dust is observed in a wide range of longitudes, with highest AOT in the West, even though the highest AOT in the Western Mediterranean is during Autumn. This is explained by dust transport to Western Europe via the Atlantic path, while Central and Eastern Europe are supplied with dust through the Mediterranean path. During summer dust appears predominantly in Central Europe, coming over the Mediterranean. During Autumn dust activity is strongest in Eastern Europe.

In addition we show there are local AOT maxima over North Italy in the Alps, in Spain South-East of the Pyrenees, and in the Rila mountains in Bulgaria. These maxima suggest increased concentrations of dust as the dust carrying air flow reaches the mountains and slows. For the Italian maxima the maximum is during April-June, typical for the Central Mediterranean transport path.