



## **Observation of optical properties and radiative forcing of nonspherical particles over Poland.**

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We present direct radiometric observations of aerosol properties and radiative forcing during DUST2005 experiment in Warsaw (March – May 2005). Observations based on radiometers, sun photometers, and lidar data obtained from in situ measurements at Institute of Geophysics and AERONET station (45 km from Warsaw) are used to construct a model of the aerosol optical properties for the use in radiative transfer calculations. The model is validated against the radiometric observations and is used to diagnose the aerosol and environmental factors that contribute to observation forcing. Multiwavelength lidar system was used to retrieve aerosol size distribution as a function of altitude. In addition based on observations of the lidar depolarization at 532 nm we detected nonspherical particles. To estimate aerosol shape we assumed spheroidal model and used the Tmatrix method for calculations of aerosol properties. Aerosol optical properties in the vertical column were measured by MICROTOPS sun photometer and CIMEL but also by the multiwavelength sun photometer. This information allows to retrieve spectral variability of aerosol optical thickness and aerosol size.

During DUST2005 campaign mean value of aerosol optical thickness was 0.25 and Angstrom exponent was relatively large (1.35). This shows that typical aerosol size over Poland is small comparing to other parts in Europe. We estimate that during Saharan dust events the mean aerosol radius was only 0.5-0.6  $\mu\text{m}$  (relatively large Angstrom exponent).