



Discrimination of aerosol sources over the eurasian boreal forest using satellite observations

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The ALANIS-Aerosols project is a feasibility study on the use of existing satellite data for discriminating between natural aerosols emitted by boreal Eurasian forests and long-range transported anthropogenic aerosols. Different satellite products are potentially useful to obtain this kind of information. These include satellites products providing the concentrations of atmospheric trace gases, in particular biogenic volatile organic compounds which play an important role in the formation of new particles through nucleation, and anthropogenic trace gases such as SO_2 and NO_2 . The direct observation of particles with a diameter larger than 50-100 nm, using Earth Observation (EO) instruments at wavelengths in the UV/VIS part of the electromagnetic spectrum provides information on the concentrations of particles which occur over most of the Eurasian Boreal forest either as a natural background or due to transport of particles produced elsewhere often as a product of anthropogenic activities. The satellite data used in this particular study is aerosol optical depth (AOD) retrieved from the Advanced Along Track Scanning Radiometer (AATSR, flying on ENVISAT since 2002) using both the forward and nadir view with the AATSR dual view algorithm (ADV). These EO observations are compared with ground-based in situ aerosol properties measured in Hytylä, Finland. Satellite and ground-based in situ observations are complemented with model calculations using the global atmospheric aerosol and chemistry model GLOMAP. Examples are presented to illustrate the complementarity of different data sources to obtain information on the temporal and spatial information on the nature of aerosols over the Boreal forest.