Ultra-Fine and Fine Aerosol Number Concentrations at Zugspitze Station, Germany

L. Ries[1], R. Sohmer[1], S. Knabe[1], B. Briel[1], W. Birmili[2], K. König[2], A. Sonntag[2], and A. Stohl[3]

[1]UBA, Federal Environment Agency, GAW-Global Station, Zugspitze 5, Schneefernerhaus, D-82475 Zugspitze, Germany; E-Mail: Ludwig.Ries@uba.de
[2]Leibniz-Institut für Troposphärenforschung, Permoserstrasse 15, 04318 Leipzig, Germany
[3]Norsk Institutt for Luftfoskning, P.O. Box 100, 2027 Kjeller, Norway

The following research aims at the quantification of long range transport aerosol distributions of ultra-fine and fine aerosols. Up to now it is not clear up to which degree the situation in Germany is influenced by long range transport of ultra-fine and fine aerosols. Starting in December 2004 at Zugspitze Station the particle size distribution from 10 to 800nm was measured with a SMPS 3080 and a CPC 3010. Additionally for the whole time range the long range transport is analyzed by the use of the FLEXPARTmodel. The results also give important additional information about the conditions at the measurement site. For more than half a year the station is measuring above the atmospheric boundary layer. In the annual average the particle size distribution is characterized by a bimodal structure. Short time measurements are useful for process studies together with transport calculations, meteorological data and data of atmospheric trace substances. Results show that the most frequent transport of aerosols comes from eastern directions to Germany. With reduced frequency long range transport of aerosols also comes from the African continent. Transatlantic transports of fine and ultra-fine aerosols seem to be relatively seldom. They have been detected in some cases only. It is planned to extend this research to a longer time scale in order to receive a meteorological correction of the aerosol measurements. Long time trends of aerosol concentration levels and long range transports also will be of future interest.

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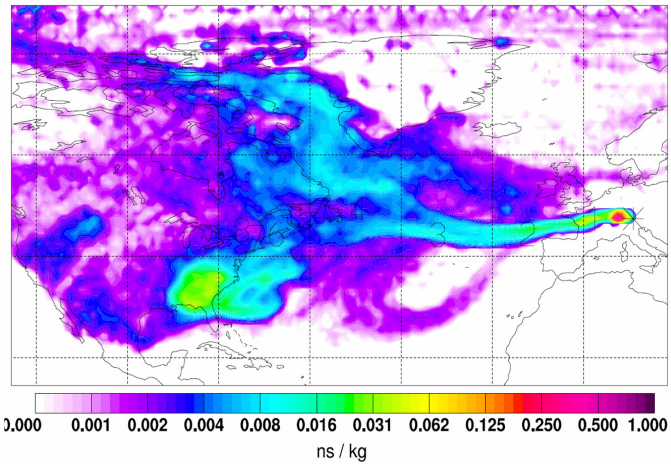

Figure 1. April 28.th 2005, transatlantic long range transport of fine and ultra-fine aerosols. Analysis FLEXPART, A. Stohl, Nilu.

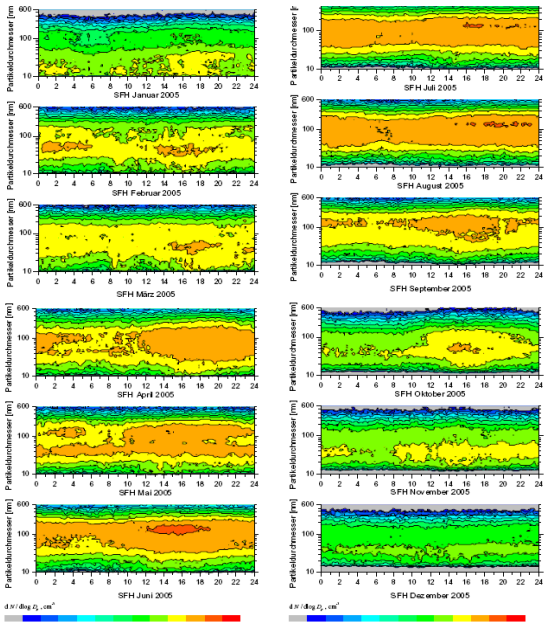

Figure 2. Monthly mean daily variation of ultra-fine and fine aerosol number concentrations, 10 to 800nm, from jan. 2005 to dec. 2005 at Zugspitze/ Schneefernerhaus station.