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Atmos. Chem. Phys., 4, 2465-2480, 2004  
www.atmos-chem-phys.net/4/2465/2004/

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## Saharan dust events at the Jungfrauoch: detection by wavelength dependence of the single scattering albedo and first climatology analysis

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**Abstract.** Scattering and absorption coefficients have been measured continuously at several wavelengths since March 2001 at the high altitude site Jungfrauoch (3580m a.s.l.). From these data, the wavelength dependences of the Ångström exponent and particularly of the single scattering albedo are determined. While the exponent of the single scattering albedo usually increases with wavelength, it decreases with wavelength during Saharan dust events (SDE) due to the greater size of the mineral aerosol particles and their different chemical composition. This change in the sign of the single scattering exponent turns out to be a sensitive means for detecting Saharan dust events. The occurrence of SDE detected by this new method was confirmed by visual inspection of filter colors and by studying long-range back-trajectories. An examination of SDE over a 22-month period shows that SDE are more frequent during the March-June period as well as during October and November. The trajectory analysis indicated a mean traveling time of 96.5h, with the most important source countries situated in the northern and north-western part of the Saharan desert. Most of the SDE do not lead to a detectable increase of the 48-h total suspended particulate matter (TSP) concentration at the Jungfrauoch. During Saharan dust events, the average contribution of this dust to hourly TSP at the Jungfrauoch is  $16\mu\text{g}/\text{m}^3$ , which corresponds to an annual mean of  $0.8\mu\text{g}/\text{m}^3$  or 24% of TSP.

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Citation: Collaud Coen, M., Weingartner, E., Schaub, D., Hueglin, C., Corrigan, C., Henning, S., Schwikowski, M., and Baltensperger, U.: Saharan dust events at the Jungfrauoch: detection by wavelength dependence of the single scattering albedo and first climatology analysis, Atmos. Chem. Phys., 4, 2465-2480, 2004. [Bibtex](#) [EndNote](#) [Reference Manager](#)

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