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The Remotely Inferred Desert Dust Optical Depth From The UV To The NIR.

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On three days during the MEIDEX mission on the shuttle Columbia, dust palls covered significant parts of the Eastern Tropical and Sub- Tropical Atlantic Ocean.

Eleven (11) orbital strips of TOA radiances, showing dust aerosol were chosen by inspection by three independent observers from the data obtained with the absolutely calibrated CCD spectral photometer of MEIDEX over the Eastern Tropical Atlantic Ocean on 27-29/Jan/2003.

Cloudy and cloud- free sea surface regions were separated by inspection from those containing aerosol. The presence of desert as opposed to biomass and marine aerosol was verified by a spectral contrast method, using the 660 and 875 nm bands.

For the first time six optical depths were inverted from the data in each strip from the UV to the NIR- two TOMS- like: 340, 380; and four Aqua- like: 440, 550, 660, 875 nm- at a spatial resolution of 70 m. The desert aerosol, clouds and ocean radiance histograms were obtained for each strip and band. The spectral histograms of the optical depths for each strip were then determined from 340 to 875 nm, using simulation for the observation conditions with the well- known 6s radiative transfer program. The physical properties of the aerosols were as defined in 6s.

The results were validated by comparison with simultaneous and co- located TOMS optical depths at 380 nm and Aqua optical depths at all bands in the Visible and NIR.