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Lidar measurements of aerosol vertical profiles from Banizoumbou (Niger), Cinzana (Mali), M'bour (Senegal)

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Three muLIDs, portable low power consumption lidar systems apted to field use in a semiautomatic mode in remote locations, have been deployed in 2006 along a longitudinal transect in Sahel, in M'Bour (Senegal), Cinzana (Mali) and Banizoumbou (Niger) for SOPs and EOP operations.

The two systems in Senegal and Mali uses a low power Nd-YAG laser firing at 532 nm a 10 nm duration laser pulse. The elastically backscattered signal from the sky is collected by a Cassegrain telescope, then spectrally filtered and split into polarizations parallel and perpendicular to the emitted radiation.

The systems automatically performs two measurements a day at fixed hour, one in daylight at 9:00 LT and one at night at 21: LT.

The system installed in Niger has additional features, as a close range 532 nm total elastic channel, that allow to measure atmospheric profiles from 10 metres from the instrument, up. This is of special value when comparing the lidar profiles with in-situ measurement of aerosol. Moreover, it employs an additional channel at 1064 nm, with an avalanche photodiode as detector. The use of a second wavelength is of special interest for the discrimination of various types of aerosols, since is proved that color index is a better marker than depolarization.

The physical parameters retrieved from the lidar data are aerosol backscatter and depolarization (and color index for the sole Niger system) profiles.

The lidar stations have not been fully operative during the whole 2006 due to lasers malfunctioning, nevertheless a consistent number of atmospheric profiles have been acquired during SOPs. A survey of the activities carried out, and data collected during 2006 is hereby given.