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Aerosol profiles determined with lidar and sun-photometer over the Pearl River Delta, China.

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The priority program "Megacities-Megachallenge - Informal Dynamics of Global Change" is a large interdisciplinary project funded by the German Research Foundation (DFG). One of the subproject deals with megaurbanisation in the Pearl River Delta, South-China, with special respect to particulate air pollution and public health. In the frame of this subproject the vertical distribution of aerosol optical properties are investigated by measurements with the multiwavelength-Raman-polarization lidar PollyXT of the IfT. The instrument can measure the particle backscatter coefficient at 355 nm, 532 nm, and 1064 nm, the particle extinction coefficients at 355 nm and 532 nm, and the particle linear depolarization ratio at 532 nm. These measurements are supported by a dual-polar sun photometer that provides height integrated data as the aerosol optical depth and the degree of linear depolarization. These instruments are placed at the East campus of the Sun Yat-sen University in Guangzhou, China. Guangzhou and the Pearl River Delta is a developing area with currently around 11 Million inhabitants. The measurements started in November 2011 and are supposed to continue for at least half a year covering the late autumn and winter season and parts of the spring season. Extensions of the measurements towards a whole seasonal cycle are planned. Thus, different meteorological conditions will lead to particle transport from several source regions. Different aerosol types are expected to be observed during the measurement period: urban particles from local and regional sources as well as dust from the deserts in Central Asia. The observed particles can be distinguished by analyzing their optical properties at several wavelengths. In particular, the depolarization measurements from both instruments promise a better determination of the particle shape.