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Global and regional trends of cloud properties derived by hyperspectral measurements in the O_2 A-band

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Homogeneous and accurate long time series of clouds are needed to detect potential trends and can be used as observational constraints of climate models. As a further matter, variability of cloud properties affect not only the global radiation budget but also the global hydrological cycle through precipitation. We present joint time series of cloud properties (top height, optical thickness and spherical albedo) derived from hyperspectral measurements of the sensor family GOME/SCIAMACHY/GOME-2. The retrievals are obtained from top-of-atmosphere backscattered solar light in the oxygen A-band using the Semi-Analytical CloUd Retrieval Algorithm SACURA. The physical framework relies on the asymptotic equations of radiative transfer. Moreover, analysis of global and regional maps together with aerosol loading can give insight into both natural and anthropogenic signatures of large scale perturbations of clouds.