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Stratospheric and tropospheric aerosol extinction profiles over Georgia, South Caucasus in 2009-2010 as retrieved from twilight sky spectral measurements.

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Stratospheric and tropospheric aerosol extinction profiles were retrieved from twilight sky brightnesses measured over Tbilisi, Georgia, South Caucasus in 2009-2010. The measurements were carried out in 700-800 nm wavelength range at solar zenith angles from 89° to 95° using CCD camera SBIG ST9 and SBIG SGS spectrograph. Monte Carlo code Siro developed in Finnish Meteorological Institute was used to design a forward model. Aerosol extinction profiles at 780 nm were retrieved with the help of the Levenberg–Marquardt algorithm. The retrieved profiles show good agreement with those retrieved from measurements of GOMOS instrument on board ENVISAT acquired above the same area and within one day time lapse. Stratospheric aerosol optical depth between 12 and 28 km averaged over the period August –October 2009 was as high as 0.015 after the Sarychev Peak eruption in June 2009 and dropped down to 0.005 in June-July 2010. The level of the tropospheric aerosol was higher in August-September 2010 in comparison with the same period of 2009 due to intense forest fires in the nearby regions.