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The characteristic properties of DOAS technique for retrieval of trace gases

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Nowadays the significant influence on a composition of the atmosphere and, hence, on a climate and human health is exerted through the anthropogenous emission of nitrogen oxides resulted from the burning of organic fuel.

Nitrogen dioxide is considered among the strongest pollutants of the atmosphere. To maintain atmosphere monitoring, an automated device has been originated on the basis of a lab spectrograph ORIEL MS257. A system of radiation input has been realized in the device enabling to register the scattered solar light at different angles of elevation in the range of 0 – 90°. The instrument has a remote control and can operate in the automated mode. To protect the instrument from the external influence and to enhance the measurement accuracy, the spectrograph has been placed into a thermostabilizing case.

Analysis of the received spectra in the region of 410 – 480 nm is conducted aiming to retrieve nitrogen dioxide concentration profiles for Minsk area. Utilizing WinDOAS package, slant column densities of nitrogen dioxide, water vapor, ozone, OBrO and oxygen dimer are retrieved for different meteorological conditions. The impact of radiation polarization and atmosphere state over results of measurements is discussed.