

## Estimating vertical fluxes of ozone within the atmospheric boundary layer

\*Sergey Borisovich Belan<sup>1</sup>, Pavel Antokhin<sup>1</sup>, Ol'ga Antokhina<sup>1</sup>, Mikhail Arshinov<sup>1</sup>, Boris Belan<sup>1</sup>, Denis Davydov<sup>1</sup>, Alexsei P<sup>2</sup>, Denis Savkin<sup>1</sup>, Tatyana Sklyadneva<sup>1</sup>, G Tolmachev<sup>1</sup>

1. V.E. Zuev Institute of Atmospheric Optics Russian Academy of Sciences, Siberian Branch, 2. Institute of Computational Mathematics and Mathematical Geophysics SB RAS

Investigation of the vertical distribution of ozone within the atmospheric boundary layer (ABL) was carried out by use of AN-2 light aircraft as a research platform. Vertical fluxes of ozone and their direction from the ground to the free-tropospheric level were calculated based on the in situ measurement data. Research flights have been performed over the greenhouse gas monitoring station located in a background area (56.1–56.4 N, 84.2–84.8 E) in the vicinity of abandoned village of Berezorechka (West Siberia). The schedule of diurnal flights was as follows: the first one just after the sunrise; the second one at noon; the third one 2-3 hours after noon, when a well-developed turbulence is observed; and the last one just before the sunset. A total of 10 diurnal cycles of measurements were undertaken. Analysis of the obtained data showed that the rate of ozone influx from upper layers of the atmosphere is 3-10 times less than the ozone production rate in the ABL. Average rate of ozone influx from the free troposphere was about  $1 \text{ mg m}^{-3} \text{ h}^{-1}$ , but ozone production rate in the ABL was about  $5 \text{ mg m}^{-3} \text{ h}^{-1}$ , so the major part of ozone is formed by photochemical reactions that occur within the ABL and only 20 % of its content is determined by the influx from the free troposphere. The vertical profiles of the ozone fluxes have shown that their maximum values are observed at heights from 200 to 600 m AGL. The height of the maximum depends on the season: in winter it is lower than 200-300 m, and in summer the maximum is observed at 500-600 m. The value of the ozone flux maximum also depends on the season and varies from  $1 \text{ } \mu\text{g m}^{-2} \text{ s}^{-1}$  in winter to  $4.2 \text{ } \mu\text{g m}^{-2} \text{ s}^{-1}$  in spring.

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