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# Discrepancies between local surface ozone concentrations and ones averaged over the route

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Two types of instruments to monitor ground ozone concentration are usually used. That are: instruments which measure ozone concentration at a local point, and instruments which measure ozone concentration averaged over the rather long route of sounding radiation.

Evidently, there should be a discrepancy between values measured by the instruments of different types. Firstly, it is due to inhomogeneous surface, which serves as the destroyer of ozone. Secondly, the difference in results may be caused by local vertical movements of the atmosphere in the boundary layer. If such movements change the direction along the route of sounding radiation a discrepancy between local ozone concentrations and ones averaged over the route is guaranteed in spite of homogenity of the earth surface is being provided.

We investigated differences between measured local ozone concentrations and concentrations averaged over the route by means of natural simulation of local atmosphere circulation generated by thermic convection. TEI 49C ozonometer was used for local point measurements. A selfmade one was used to measure ozone concentration averaged over the route.

The route for the sounding ultraviolet radiation is built between tops of the two parallel long buildings of about 30 m height and at a distance of 50 m. Buildings have approximately east-west orientation. Sun rays never have access to the back side of the first building and always heat the front side of the other one if clouds are absent. This leads to a local atmosphere circulation generated during sunny days due to differences in temperatures of neighboring sides of the buildings. Tropospheric air with relatively

high ozone concentration falls down along the cold side of the first building, ozone is being destroyed at the surface of the ground, and then impoverished air lifts along the warm side of the second building.

Evidently, averaged ozone concentration between the buildings should be smaller than local one near the cool side and greater than ozone concentration near the warm side.

Clouds or strong easterly (westerly) winds between the buildings destroy the differences between ozone concentrations. The effect should not be detectable in the morning until the south side of the second building becomes significantly warmer than the north side of the first one.

These general conclusions are confirmed by direct measurements made in August-September 2005. The results may be directly generalized to a case of an ordinary phenomenon - alternation of lowering and rising convective air flows above a homogeneous surface.

Thus, our experiments clearly indicate that coincidence of results of ozone measurements at a local point with ones averaged over the route path can not be achieved in general case, even if requirements of WMO to the arrangement of surface ozone measurements are being satisfied. Methods based on measurement of ozone concentration averaged over the route are preferable for purposes of surface ozone monitoring.