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Seasonal variation of ground level ozone in the High Tatras Mountain, Slovakia

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Formation, transport and impact of tropospheric ozone and other photo-oxidants is a major environmental problem due to high emissions of ozone precursor substances. The Slovak national air emissions of ozone precursors have declined substantially in the last 15 years and the ground level ozone concentrations followed similar development as in other European countries, i.e. the peaks decreased and mean concentrations did not exhibit significant trends. Nevertheless, the measurements in 2003 have shown the highest values at the most of 22 real - time Slovak ground level ozone monitoring stations. There is an evident ground level ozone concentration dependence on altitude and ozone accumulation between 500 and

1600 m a.s.l. in central Europe. Slovakia is a mountainous country. 78% of its territory is situated above 300 m a.s.l. The altitude effect in ground level ozone concentrations is therefore an important phenomenon. The contribution will focus on presentation of data measured by UV photometers at five stations situated in the High Tatras Mountain along the elevation profile ranging from 706 up to 2633 m a.s.l. The measurements have confirmed the altitude effect in ground level ozone concentration. In 2003 the annual average ground level ozone concentrations in the High Tatras varied from 72 μg m^{-3} (706 m a.s.l.) to 114 μg m^{-3} (2634 m a.s.l.), respectively. The extreme mean hourly values were recorded in main spring or secondary summer maximum and all values reached or exceeded the human health threshold of 180 μg m^{-3}. The main spring maximum at elevation of 800 m a.s.l. is connected with favorable photochemical conditions (increase of air temperature and decrease of relative humidity, positive changes in sunshine duration and UV radiation) and the abundance of pollution components as NO_2 and NO_3. The secondary summer maximum is probably more influenced by biogenic hydrocarbons emissions of isoprene and the mono-terpenes as important air components of forested environments. The region of High Tatras was hit by a

strong wind on November 19, 2004 and more than 100 km^2 forest area was destroyed. It is expected that the systematic monitoring could bring interesting results on the changes of ground ozone concentrations in the deforested area, especially in warm periods of the year due to strongly reduced emissions of biogenic hydrocarbons.