Geophysical Research Abstracts, Vol. 8, 06048, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06048

Ozone measurements in the Khibiny Mountains (the Kola Peninsula, Russia)

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Ozone measurements at the top of the mountain Lovchorr (the Khibiny mountain range, 1095 m asl) started in spring 2004. There is a high correlation (0.93) between the monthly average ozone concentrations at the top of the mount Lovchorr and at the altitude of 1095 m above Sodankyla (Sodankyla is the nearest ozone sonding station; it is 300 km to the south-west from the mount Lovchorr). The averaged monthly ozone concentrations at the top of the mountain Lovchorr are smaller (by 3.4 ppb in average) than those at the same altitude above Sodankyla. This can be attributed to the effect of the forced rising of the air, when the air mass runs into the mountain obstacle. In this case, the surface air with a low content of ozone rises to the top regions of the mountains.

The year averaged maximum altitude of the mixed layer in the region considered is 610 m and only in summer months reaches 900-1050 m. Consequently, most of the year the station is either at the height exceeding the characteristic regional height of the mixed layer or near its upper boundary. There is no diurnal variation of the ozone concentration, which is typical for the surface layer.

For all seasons the ozone concentrations at the top of the Lovchorr mount are always higher than the background ozone concentration in Lovozero (160 m asl, the distance between the stations in Lovozero and on the Lovchorr mount is about 60 km).