Geophysical Research Abstracts, Vol. 7, 05379, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05379
© European Geosciences Union 2005

Early stage of wintertime ozone buildup in the Northern Hemisphere midlatitudes

G. Nikulin (1) and A. Karpetchko (2)

(1) Swedish Institute of Space Physics, Kiruna, Sweden, (2) Finnish Meteorological Institute, ARC, Sodankylä, Finland

It is recognized that the wintertime total ozone increase in extratropics results from the mean meridional circulation in the stratosphere. Many efforts have been done to study the total ozone buildup in winter-spring (December-March) and its relation with the residual circulation through proxies like the vertical component of the Eliassen-Palm flux or eddy heat flux. We concentrate our attention on the early stage (October-December) of ozone buildup during 1979-2003. The zonal mean (50˚-60˚N) total ozone tendencies are always negative in September, close to 0 in October and positive in November-December with higher values in December. At the same time a longitudinal structure of tendencies is not uniform. In October a maximum of positive tendencies is located over eastern edge of Russia while negative tendencies cover the opposite part of the NH. In November the maximum is still in the same position and positive tendencies spread eastward and westward from the maximum covering almost all domain north of 30˚N with exception of a small negative region over the Atlantic. The December tendencies are positive over all NH midlatitudes and the second maximum appears over the north-western Atlantic. The longitude distribution of ozone tendencies in October-December is identical to total ozone distribution in the same months which is related to the structure of quasi-stationary planetary waves in the lower stratosphere. We also investigate and discuss statistical connections of ozone tendencies with eddy heat fluxes, the diabatic residual circulation and intensity of the Aleutian low.