

## **LONG-TERM TRENDS IN MIDDLE ATMOSPHERE DYNAMICS AT NORTHERN MIDDLE LATITUDES**

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Humans are polluting the atmosphere. Due to increasing atmospheric concentration of greenhouse gases and changing stratospheric ozone concentration, both of anthropogenic origin, various quantities in the middle atmosphere display long-term changes and trends. A possibility was indicated of change of such trends in the dynamics in the northern midlatitude middle atmosphere as a whole in the 1990s. To search for such change of trends we use data on winds in the mesopause region, on total columnar ozone, on ozone laminae, on winds in the middle and lower stratosphere, and on peak electron density in the E region of the ionosphere. One group of parameters changes their trends around 1990 (mesopause region winds, E region ionosphere, number of small laminae), the other in the mid-1990s (total columnar ozone, lower and middle stratospheric winds, the overall ozone content in large laminae per profile). Altogether they create a skeleton of scenario of the change of the middle atmosphere dynamics trends in the 1990s, which however needs to be completed by information on the behaviour of dynamics in the upper stratosphere and mesosphere. Drivers of these changes seem to be different for the first date (potential driver is hypothetical change of gravity wave activity) and for the second date (trends in NAO and behaviour of the Arctic winter stratospheric vortex might play some role).

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