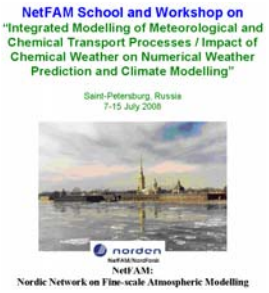
POSTER PRESENTATION



P-12. Anna Kanukhina: Long-period variations of stationary planetary waves

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Strong inhomogeneity of meteorological fields is one of the main characteristics of stratospheric dynamics during winter. The fundamental problem of atmospheric dynamics including seasonal and interannual variability and climatic trends of temperature and planetary wave activity within troposphere and stratosphere, as well as possible effects within middle atmosphere caused by these becomes increasingly relevant for climate research. The reason for this is the need to study dynamical and photochemical processes impacts on observed climatic changes of atmospheric temperature.

The main goals of the work includes the analysis of the long-term changes of the zonally averaged temperature, wind, geopotential height and wave activity of the SPW1 and SPW2 during the last decades using NCEP/NCAR assimilated fields from 1948 to 2007, simulation of the SPW propagation on the basis of the observed changes of the zonal-mean wind in the troposphere as an input parameter for the linearized model of planetary waves and finally the comparison of observed and simulated changes of SPW. Because of the lack of satellite data reanalysis data not only in the southern hemisphere are less reliable before 1978, and results of trend analyses crossing that data have to be considered with special care. The detailed analysis of the climatic trends in the zonally averaged temperature, zonal mean wind, and activity of SPW1 and 2 in winter period has been performed already. The results obtained show a noticeable climatic variability of the intensity and position of the tropospheric jets that are caused by temperature changes in the lower atmosphere. As a result we can expect that this variability of the mean flow will cause the changes of the SPW propagation conditions.

The simulation of the SPW1 performed with the linearized model supports this assumption and shows that during the last 40 years the amplitude of the SPW1 calculated in the stratosphere and mesosphere increased substantially. The analysis of the SPW amplitudes extracted from the geopotential height and zonal wind NCEP/NCAR data supports the results of simulation and shows that during the last years there exists an increase in the SPW1 activity in the lower stratosphere. These changes in the amplitudes are accompanied by increased interannual variability of the SPW1 also. Analysis of the SPW2 activity shows that changes of its amplitude have a different sign in the winter (northern) hemisphere and at low latitudes in the summer (southern) hemisphere. Value of the SPW2 variability differs latitudinally and can be explained by non-linear interference of the primary wave propagation from below and secondary SPW2.