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Numerical modeling of the natural and anthropogenic factors influence on the past and future changes in polar, mid-latitude and tropical ozone

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The INM RAS – RSHU chemistry-climate model of the lower and middle atmosphere is used to compare the role of natural and anthropogenic factors in the observed and expected variability of stratospheric ozone. Numerical experiments have been carried out on several scenarios of separate and combined effects of solar activity, stratospheric aerosol, sea surface temperature, greenhouse gases, and ozone-depleting substances emissions on ozone for the period from 1979 to 2050. Simulations for the past and present periods are compared to the results of ground-based and satellite observations, as well as MERRA and ERA-Interim re-analysis. Estimation of future ozone changes are based on different scenarios of changes in solar activity and emissions of ozone-depleting substances and greenhouse gases, as well as the possibility of large volcanic aerosol emissions at different periods of time.