



Seasonal features of the quasi-biennial variations of the NO₂ stratospheric content derived from results of ground-based measurements

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According to the results of ground-based spectrometric measurements of the stratospheric column NO₂ contents (SC NO₂) within the Network for the Detection of Atmospheric Composition Change (NDACC), satellite measurements of total ozone (TO) and ERA-Interim reanalysis data of temperature, seasonal and latitudinal distributions of the amplitudes of the quasi-biennial variations of these quantities are obtained. The dependence of the diurnal cycle in the SC NO₂ on the phase of quasi-biennial oscillation in the equatorial stratospheric wind (QBO) is revealed. The QBO effects in the SC NO₂, TO, and stratospheric temperature in the northern (NH) and southern (SH) hemispheres are most significant during the winter-spring periods. Furthermore they exhibit an essential inter-hemispheric asymmetry. The SC NO₂ in the Antarctic for the west QBO phase is less than that for the east phase, and the quasi-biennial variations of the SC NO₂ in the SH middle latitudes are opposite to the variations in the Antarctic. In the NH, the winter values of the SC NO₂ are generally less during the west QBO phase than during the east phase, whereas in spring, on the contrary, the NO₂ values for the west QBO phase exceed those for the east phase. Along with SC NO₂, the features of the quasi-biennial variations of TO and stratospheric temperature are discussed. Possible mechanisms of the quasi-biennial variations of the analyzed parameters are considered for the different latitudinal zones.