



Long-term variation of winds in the low and middle stratosphere

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For study of such a complicated phenomenon as climate change, investigation of long-term variations of other atmospheric characteristics is also useful. On the other hand, it is reasonable to establish long-term variations for as many places as it is possible, since investigations indicate regional changes of trends in long-term variation of atmospheric parameters. Long-term variation of winds in the lower and middle stratosphere are studied here on the basis of radio-sounding carried out at the Central Aerological Observatory of the Hungarian Meteorological Service, Budapest, Hungary. Wind data of three solar cycles including the period 1962-1994 are used taking yearly mean values of midday ascents. Determining trend of the wind speed by linear regression analysis, it has been found that wind speed indicates decreasing tendency both in the lower and middle stratosphere as compared to increasing trends in the troposphere. The former trend is associated with decreasing temperature due to the greenhouse gas effect (diminishing temperature accompanied with increasing density and reduced wind velocity). Change of wind direction there enhanced by the increasing rate of change in wind direction with height and due to the opposite trends in the stratosphere and troposphere would affect exchange of ozone and halocarbons between the troposphere and stratosphere.