

OZONE AND TEMPERATURE RESPONSE TO DECADAL SOLAR VARIABILITY OVER TROPICS

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To investigate the effects of decadal solar variability in temperature and ozone, along with interconnections to other features of the middle atmosphere, the data obtained from the Halogen Occultation Experiment (HALOE) aboard Upper Atmospheric Research Satellite (UARS) during the period 1992-2005 have been analyzed using a multifunctional regression model. The inferred annual-mean solar effect on temperature is found to be positive in the lower stratosphere and near stratopause, while it is negative in the middle stratosphere. In the mesosphere it is of the order of 0.5-1K/100sfu. The inferred solar effect on ozone is found to be significant in most of the stratosphere (2 ± 1.1 - 4 ± 1.6 % / 100 sfu), it is insignificant in the lower mesosphere whereas it is of the order of 5%/100sfu in the upper mesosphere. The results over stratosphere are compared with solar response obtained from SAGE II data for the same period. In general, responses of solar signal in temperature and ozone profiles show good agreement for HALOE and SAGE II measurements. Both the data sets show that, the solar effects on ozone and temperature are found to vary dramatically during some months, at least in some altitude regions. Solar effects on temperature are found to be negative during autumn while solar effects on ozone show maximum the next season (winter). Details will be discussed.

11 Year Solar Cycle, Ozone, Temperature, Tropics

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