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Deciphering QBO and ENSO Influence on Stratospheric Transport with Ozone and Water Vapour from Aura MLS

The Brewer-Dobson Circulation (BDC), stratospheric global mass circulation, influences the distribution of trace elements in the stratosphere, particularly radiatively active water vapour and ozone. The stratospheric meridional transport responds to various oscillations in the stratosphere, notably the tropical Quasi-Biennial Oscillation (QBO) and El Niño–Southern Oscillation (ENSO). QBO influences the meridional transport through the changes in zonal-mean zonal wind. An intensified meridional transport is observed during its westward QBO phase. The composite analysis of ozone and water vapour from the Aura Microwave Limb Sounder (MLS) reveal distinct QBO signatures. Additionally, ENSO-induced changes are linked to enhanced wave propagation. Despite the less periodic nature of ENSO compared to QBO, significant changes are observed in the composite analysis of ozone and water vapour in the stratosphere.

Topic

Atmospheric composition (Earth and planets), chemistry and transport

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