

Increase of tropospheric ozone in the tropics and transport of midlatitude UT/LS air

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By analyzing ozone data obtained in SHADOZ ozonesonde network, ozone increase in the lower and middle troposphere was frequently observed in the lower and middle troposphere. The occurrence of the ozone increase exceeds 40% in the average. Mechanisms for increasing tropical tropospheric ozone are discussed by using backward trajectory, potential vorticity, and satellite hot spot data. In the tropical Pacific region, transport of midlatitude UT/LS air, containing high ozone and low water vapor concentrations, were often transported to the equatorial region. Between cyclone and anticyclone near subtropical jet stream, high ozone air mass near tropopause subsided and intruded into tropical middle troposphere. This process is similar with that of the intrusion of stratospheric air in the midlatitude. The transportation process of midlatitude UT/LS air to the equatorial region and the occurrence of this phenomenon will be discussed in detail.