



On the origin of the air between multiple tropopauses in mid-latitudes

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Double tropopauses (DTs) are a recurrent structure in the mid-latitudes (Añel et al, 2008). Recent studies have relied on the notion of the excursion of tropical air from the upper troposphere into higher latitudes, overlaying the tropopause of the mid-latitudes. Randel et al. (2007) found a coincidence of DT profiles with reduced ozone amounts in the LS, and with regions of enhanced transport from the tropics to higher latitudes above the subtropical jets. Pan et al. (2009) suggested the association of DTs with intrusions of low-latitude air masses with low static stability and low ozone concentrations into the LS of mid-latitudes, related to Rossby wave breaking events. In this work we analyzed the origin and characteristics (ozone, water vapor, vorticity) of the air for Boulder radiosonde station immediately below/above the first/second tropopause and the air between for both by using a Lagrangian approach based on Flexpart and five years of ERA analysis data 2000-2004.

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