



Upward mass fluxes in the tropical lower stratosphere derived from radiative transfer calculations

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The upward motion in the tropical lower stratosphere is associated with the Brewer-Dobson circulation, which plays an important role in the stratosphere-troposphere-exchange of different chemical species, in the radiative energy balance, and consequently in global climate change. It is therefore critically important to have a quantitative estimate of the strength of the BDC based on observations, and to test and validate GCM simulations of the BDC. However, the BDC cannot be directly observed since it describes the Lagrangian motion. In this study, we derive the tropical upward mass fluxes associated with the Brewer-Dobson circulations using radiative transfer calculations with observed atmospheric profiles of temperatures, ozone, and water vapor. We will focus on the impact of the accuracy of the radiative transfer schemes on the derived vertical motions in the tropical lower stratosphere.