

The stratospheric mean meridional circulation as diagnosed from reanalyses

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On the global scale, the dominant dynamical feature that influences the zonally averaged distribution of temperature and species in the stratosphere is the Brewer-Dobson circulation (BDC), a wave-driven, Lagrangian mean, meridional mass circulation linking the tropics to the higher latitudes. The circulation can be broken down into three main parts; ascent in the tropics bringing tropospheric air into the stratosphere, poleward transport in the stratosphere and descent at middle and polar latitudes, ultimately bringing stratospheric air back into the troposphere. Understanding the observed variability of the BDC throughout the depth of the stratosphere is of interest for a range of climatic processes. Changes in the BDC will alter transport of anthropogenic species through the tropopause that can subsequently alter the radiative and chemical balance of the stratosphere. In this presentation I will discuss how we can use reanalysis output to diagnose mean characteristics and variability in the BDC, and how we can use stratospheric constituent observations to assess the quality of reanalysis output.