



Variability and Trends in Effective Diffusivity in the Stratosphere

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Computation of effective diffusivity is one means to quantify isentropic mixing in an equivalent-latitude based coordinate system, and has been previously applied to studies of both the upper troposphere and stratosphere. Here, we present variability and trends in effective diffusivity calculated using potential vorticity from multiple meteorological reanalyses. We quantify variability due to annual and semiannual cycles, the quasi-biennial oscillation (QBO), solar cycle, and ENSO. We find a strong QBO signal in the tropics, consistent with previous work, and a large seasonal component at the higher latitudes. We also show trends in effective diffusivity that are robust across multiple different meteorological reanalyses, particularly in the southern hemisphere overworld ($> \sim 450$ K). These trends are likely a reflection of changes in stratospheric wave-driving and circulation changes noted in previous studies. We present preliminary research showing the relationships between trends in the effective diffusivity and changes in wave-driving, stratospheric circulation, and trace constituent distributions.