

## 5.103 Interannual Variability in Interhemispheric Transport Times and Long-term Trends.

Early Career Scientist

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Abstract:

Understanding the interhemispheric transport helps us track the movement of air and potential dispersion of air pollutants. Here we examine variations of the transport from Northern Hemisphere (NH) mid-latitudes surface using simulations of two idealized tracers. A NH clock tracer (AOA\_NH) that is initially set to a value of zero throughout the troposphere that gives the mean age since was at the NH mid-latitude (30-50N) surface, and a decay tracer (NH\_5) with fixed concentration at the NH mid-latitude surface and spatially uniform 5-day exponential decay. We examine the interannual variations in the tracers (and inferred transport timescales), and relate to meteorological processes (e.g., precipitation) and climate modes (e.g., ENSO). To investigate the long-term trend of transport variability, we also evaluated the model with free runs from 1960 to 2100. For AOA\_NH, the interannual variations are generally small outside the tropics. Within the tropics, there are substantial interannual variations of AOA\_NH that can be related to changes in the location and intensity of convection. There is also substantial interannual variability of the NH\_5 tracers both within the tropics and within the southern extratropics. This suggests that the interannual variability in the southern hemisphere will differ for tracers with northern hemisphere sources but different chemical lifetimes.