

Virtual ACOM Seminar

The Brewer-Dobson circulation in CMIP6 models

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Links: <https://operations.ucar.edu/live-acom>

ABSTRACT

The Brewer-Dobson circulation (BDC) is a key feature of the stratosphere that models need to accurately represent in order to improve the representation of surface climate variability. For the first time, the Climate Model Intercomparison Project includes in its phase 6 (CMIP6) a set of diagnostics that allow for careful evaluation of the BDC. In this talk, I present the main results of this evaluation in comparison with observations and reanalyses using historical simulations. CMIP6 results confirm the well-known inconsistency in BDC trends between observations and models in the middle and upper stratosphere. The increasing CO₂ simulations feature a robust acceleration of the BDC but also reveal large uncertainties in the trends in the deep branch, mainly related to the different wave drivers across models. The intermodel spread as well as the role of internal variability is also evaluated. Finally, the very close connection between the shallow branch and surface temperature is highlighted, which is absent in the deep branch.