



Comparisons of historic satellite temperature trends with ensemble simulations from WACCM constrained by observed forcings

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Tropospheric and stratospheric temperature trends simulated by the Whole Atmosphere Community Climate Model (WACCM) with observed forcings (so-called REFC1 simulations) are compared to satellite observations covering 1979-2015. Model simulations are evaluated based on five realizations, with slightly different initial conditions. Global mean temperature changes show excellent agreement between model and observations, including tropospheric warming and stratospheric cooling that increases with altitude. There is little variability for trends among the model realizations in low latitudes, but large variability in polar regions, with the inference of corresponding large uncertainties in the single realization available from observations. We evaluate temperature changes associated with ozone evolution before and after 1997 (ozone loss and partial recovery), showing clear impacts in the upper stratosphere and in the Antarctic ozone hole.