Reanalysis of the stratosphere in GEOS-5: Lessons learned from MERRA and future prospects

Steven Pawson[†];
[†] NASA GSFC, USA
Leading author: Steven.Pawson@nasa.gov

The MERRA configuration of GEOS-5 includes about 30 layers in the middle atmosphere, with an upper boundary near 80km. SSU and AMSU radiance data are assimilated, which yield good constraints on the analyses up to the upper stratosphere. This paper examines the performance of MERRA, with foci on: the somewhat erratic system behavior in the 1980s, as numerous SSU instruments were available for short periods; the transition from SSU to AMSU radiances; conflicts between equivalent instruments on different platforms, given in the context of bias correction and the diurnal cycle; and, the relative stability of the analyses in the 21st Century. The results from MERRA provide guidance for how to use the operational polar-orbiting datasets in future reanalyses. Additional discussion will be directed at the possible use of research datasets, from limb-sounding instruments, in future multi-decadal products.