P43. Sensitivity of Simulated Convection-Driven Stratosphere-Troposphere Exchange in WRF-Chem to the Choice of Physical and Chemical Parameterization

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WRF Cloud Top Height (km) / NEXRAD Echo Top

29-30 May 2012

- 1-2 June 2012
- 3 Bulk Microphysics Parameterizations, Planetary Boundary Layer Parameterizations, and Chemical Mechanisms were evaluated:

OBS

MOZ

RACM

СВМΖ

ACM2

YSL

QNSE MY

NSSL

MOF

- BMP: NSSL 2-mom, Morrison 2-mom, and Milbrandt and Yau 2-mom
- PBL: YSU, QNSE, and ACM2
- Chemical Mechanisms: RACM/VBS/SOA, CBMZ/MOSAIC 4-bin, and MOZCART

*Dashed lines show the minimum and maximum trace gas profile while solid lines show the mean profile. The gray dots show the aircraft observations. Profiles are calculated for points within cloud and outside of cloud. ^Profiles of mean frozen hydrometeor concentrations show highest concentrations of ice with the NSSL BMP, resulting in the highest concentrations of water vapor injected into the stratosphere.

Summary

WRF-Chem simulations were most sensitive to choice in BMP. There is measurable sensitivity of the organization, vertical extent of convection, and injection of water into the stratosphere. NSSL 2-moment BMP provided the best results among BMPs. There was little sensitivity to choice in PBL parameterization and chemical mechanism. This work has been published in *Earth and Space Science*, doi: 10.1002/2017EA000287