



Recent Progress of JTTI FY20 Aerosol Data Assimilation in Support of RRFS-CMAQ

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This JTTI FY20 aerosol data assimilation (DA) project focuses on using the JEDI tool to adjust the NOAA UFS's aerosol initial conditions. For the regional domain, its target is RRFS-CMAQ, and we plan to assimilate both in-situ measurements and AOD. It also includes the influence of global aerosol model (GEFS-Aerosol) DA on the regional domain through the aerosol lateral boundary condition (LBC).

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Accomplished Tasks:

- Set up the linkage between JEDI and RRFS-CMAQ ✓
- Set up IODA converter and AIRNow DA for 3D-Var ✓
- Set up the preliminary workflow for DA-prediction run ✓

An example of applying AIRNow DA 4 cycles per day for the RRFS-CMAQ C401 domain



Planned Next Steps:

- Set up the JEDI AOD DA for the regional domain
- Develop/test/tune the background error covariance (BEC)
- Developmental run with both AOD and AIRNow DA, and with global aerosol LBC.

Challenging Items:

- The DA forward operator issue, which also depends on the aerosol types, speciation and sizes.
- RRFS-CMAQ and its performance are moving targets.
- Uncertainties of vertical, size and speciation distributions.
- Other technique issue such as BEC matrix, workflow etc.

