

Status and Progress of Observation Usages in the GMAO GEOS Atmospheric Data Assimilation System

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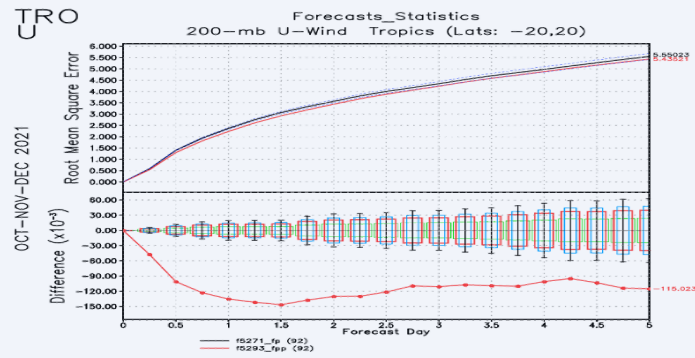
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GEOS configuration

- FV3 dycore + GEOS physics suite
- GSI hybrid 4D EnVar, Aerosol assimilation

Key updates since last ITSC

- CRTM update to CRTM v2.3.0
- Revised treatment of GEOS-16 AMVs
- Modifications to observation operator for RO and assimilated top lowered
- Correction for high-latitude buoy data handling
- Updates to the input observing system:
 - IASI Metop-C radiances
 - Radio occultations from KOMPSAT and Paz
 - Commercial radio occultations from SPIRE



Revised handling of GEOS-16 AMVs significantly improved forecast RMSE

Improving the use of MW and IR data in GEOS

- Evaluation of using CRTM v2.4.0 in GEOS
- Revisit of the handling of GMI data to address small data sample issue for bias correction
- Assimilation of surface-sensitive MW radiances over land
- Evaluation of active-passive microwave land surface database using GEOS
- Use of additional IR channels in upper stratosphere
- Modifications to treatment of IR data assimilation to fix unrealistic bias and negative data impacts due to poor cloud detection
- Improving the assimilation of IASI and CrIS radiances over land

Development of JEDI-based GEOS

The planned initial implementation focuses on background error covariance and observation operator configurations to ensure consistency with GSI data usages.

OBS Type	Status
GMI	Done
AMSR2	Done
MHS	Done
AMSU-A	Done
ATMS	Done
CrIS	Done
IASI	Done
AIRS	Done
AVHRR	Done
Ozone	Done
Winds	Satellite AMVs, scat winds, sondes, aircraft
Conventional temperature	Sondes, aircraft
Conventional moisture	Sondes
Conventional surface pressure	Surface, Surface marine, sondes
GNSS RO	In progress

