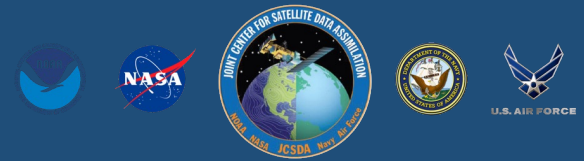




Assessing the impact of ROMEX observations with JEDI-UFS: Early Results

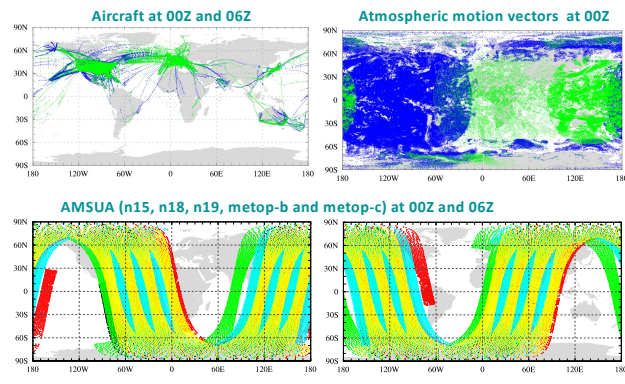
Hailing Zhang (hailingz@ucar.edu), H. Shao, Y.-H. Kuo, B. Ruston, J. Braun,
University Corporation for Atmospheric Research, Boulder, CO, USA



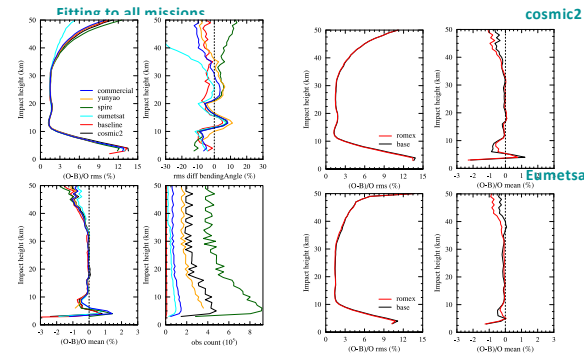
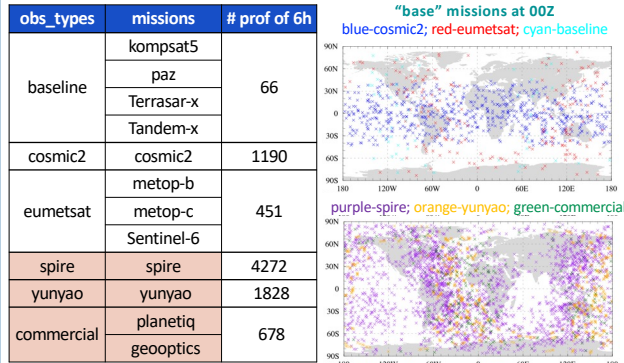
Introduction and Summary

- Motivations**
 - To evaluate the robustness of the JEDI-UFS data assimilation and forecast system.
 - To investigate the impact of supplemental radio occultation data from ROMEX on the analysis and forecast in JEDI-UFS.
 - JEDI stands for the Joint Effort for Data assimilation Integration,
 - UFS stands for the Unified Forecast System, a community-based, comprehensive Earth modeling system.
- Main findings**
 - The assimilation of supplemental ROMEX data impacts positively the short term forecasts in observation space.
 - ROMEX data help reduce RMS, bias in the fitting to radiosonde, aircraft, and AMSUA radiance data, and increase their observation counts being assimilated.
- Ongoing and future work**
 - To conduct more diagnoses in model space.
 - To investigate the impact of ROMEX data using 2-dimensional operator.
 - To investigate the impact of ROMEX data on high impact weather systems.

Observation Samples

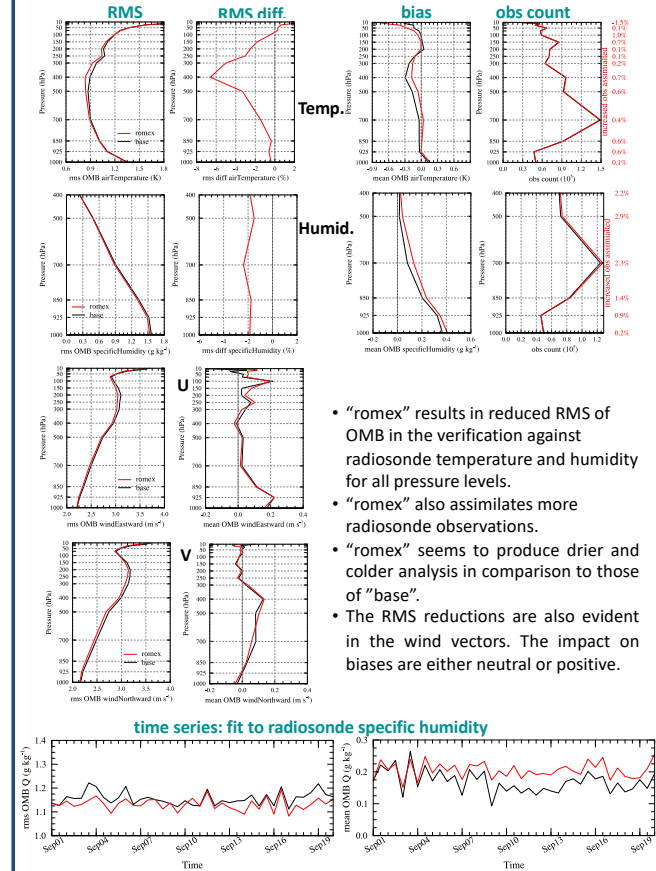


RO Profiles and RO Space Statistics



- RO missions show variation in the OMB statistics. It may need further investigation.
- The assimilation of supplemental RO data in "romex" results in improved fitting to base missions below 35km. Both RMS and bias of OMB are reduced in "romex".

Fit to Radiosonde Observations: OMB Statistics

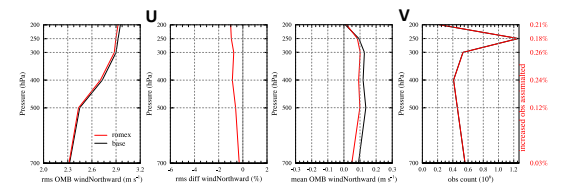


- "romex" results in reduced RMS of OMB in the verification against radiosonde temperature and humidity for all pressure levels.
- "romex" also assimilates more radiosonde observations.
- "romex" seems to produce drier and colder analysis in comparison to those of "base".
- The RMS reductions are also evident in the wind vectors. The impact on biases are either neutral or positive.

JEDI Configuration and RO Data Assimilation

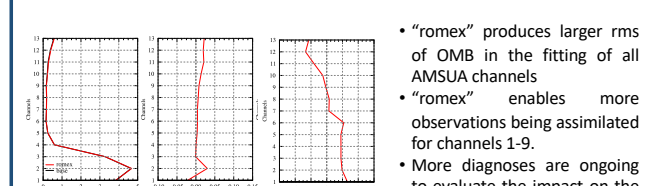
JEDI algorithm	Hybrid 3d Envar, 40 ensemble members	
resolution	C384 (~25km), L127	
observations	GNSSRO, radiosonde, aircraft, satellite wind, surface pressure, AMSUA	
RO operator	ROPP1D	
RO obs. error	NRL	
Forecast model	Unified Forecast System V17	
Exp.	base	romex

Fit to Aircraft Observations: OMB Statistics



- "romex" also reduces the RMS and mean of OMB statistics in the verification against aircraft wind vectors.

Fit to AMSUA Observations



- "romex" produces larger rms of OMB in the fitting of all AMSUA channels
- "romex" enables more observations being assimilated for channels 1-9.
- More diagnoses are ongoing to evaluate the impact on the assimilation of AMSUA.