Atmospheric Chemistry
Observations & Modeling

ACOM Seminar

WRF-Chem/TEMPO indirect validation efforts during AEROMMA/STAQS

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FL 1001
Link: https://operations.ucar.edu/live-acom

ABSTRACT

Chemical transport models (CTMs) can play an important role in TEMPO validation activities by providing a means of including non-coincident measurements in the validation process. This is referred to as “indirect validation " and is accomplished by:

1. Comparison between the CTM and non-coincident validation measurements to determine CTM biases and RMSE
2. Comparison between the CTM and satellite retrievals to determine the biases between the CTM and retrievals.
3. Comparison of these two sets of CTM biases and RMSE can be used to indirectly assess the biases and RMSE between satellite and the non-coincident validation measurements.

In this presentation, we use airborne insitu and remote sensing NO_2 measurements to evaluate high resolution WRF-Chem simulations during August 2023 over Chicago (4 days), New York (3 days), and Toronto (1 day). We then compare the WRF-Chem simulations to TEMPO V3 NO_2 retrievals for the same regions. This indirect validation approach allows us to evaluate the TEMPO NO_2 column retrieval under a wider range of conditions (11 days) compared to 1-4 days using direct validation. Indirect validation also allows us to evaluate diurnal and urban/suburban variations in the TEMPO NO_2 column.

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