

# Analysis of ARCTAS and related satellite measurements utilizing a hierarchy of models – PI J. M. Rodriguez, Institutional Co-i: Ross Salawitch

- **Pre-mission contributions**
  - Carry out and analyze GMI Combo simulations for 2004-2006 utilizing both GEOS-4 and GEOS-5 systems; assess quality by comparison to data (satellite, sonde, ground-based), and evaluate inter-annual variability and differences between GEOS-4 and GEOS-5.
- **On-site**
  - Carry out and interpret tagged CFC tracers to track STE and mixing of stratospheric air with tropospheric pollution plumes
  - Near-real time analysis of in situ BrO using constrained photochemical model to estimate  $B_{ry}$  along a/c flight track
  - Near-real time comparisons of tropospheric BrO columns from a/c profiles to inferred tropospheric BrO, found by subtracting model stratospheric BrO from OMI total column BrO
  - Near-real time analysis of ozone production & loss efficiency based on measured radicals and spectral flux to assess effects on the ozone budget of boreal fires and tropospheric halogens
  - Near real-time analysis of production and loss of HOx, constrained by measurements.
- **Post-mission**
  - Comparison of modeled and measured CO, BrO and other species to constrain emissions (BrO explosion, biomass burning, etc.) as well as pathways of pollution to the Arctic.
  - Implications of HOx and BrO chemistry for O<sub>3</sub>, NOx/HNO<sub>3</sub>, DMS oxidation, both in the Arctic and globally (multi-year calculations with GMI with “new” chemistry).
  - High-resolution full chemistry simulations with GMI (stratosphere plus troposphere) for the ARCTAS period, to examine role of chemistry and stratospheric-tropospheric exchange.

## **Operational Requirements/Issues (Rodriguez/Salawitch)**

- **Four ethernet connections and four adjacent work areas (during times of overlap: partial overlap during first phase; considerable overlap during second phase for at least two stations)**
- **Access to black and white printer (routine) and color printer (occasional)**
- **Near-real time access to OMI BrO column retrievals, AMF, and albedo as well as near-real time access to output of chemical forecast runs**
- **Access to AIRS CO, and other relevant satellite products.**
- **Issues for discussion:**
  - **Coordination and operation of the different chemical forecast activities (who/when/how – available visualization and analysis software).**
  - **How much data from model/forecast results needs to be on-site.**
  - **What specific model results would be useful prior to the mission.**