Focus Groups in ASR

Objective of focus groups

• Focus on critical processes and/or properties to improve global and regional models.

• Aerosol absorption...how should the new instruments and measurements be used, combined, etc.?
  • Need for shorter wavelength – 405 nm, 355 nm and improve instruments
  • Desire to have ongoing closure experiment to assess filter techniques
  • UV MFRSR – total extinction
  • Longwave absorption – samples, routine basis
  • Compare column retrievals of absorption by UV MFRSR – diffuse transmission – compare with in situ
  • Utilize solar FTS instruments at SGP and Darwin and Manaus
  • Compare remote and in situ techniques at GVAX with high aerosol loading (if cloudfree skies)
  • New – CAPS technique for aerosol extinction
Focus Groups in ASR

Objective of focus groups

• Bring critical areas of research to the attention of the community and program management

• Some needs expressed by Xiaohong Liu in his talk about aerosol representation in GCM
  – Refractive index of dust
  – Hygroscopicity of dust and organics
  – Vertical profiles
    • Injection heights of biomass burning
    • Measurements of aerosols in free troposphere
    • SOA formation in upper troposphere
  – Water uptake
    • Determine appropriate parameterization
    • how to measure and define this for the column

• How can ASR use assets for long term systematic studies of aerosols to benefit models?
Aerosol Representation in GCM

**Water uptake**
- \( f(\text{Rh}), g(\text{rh}) \) at surface facilities (6-7 locations worldwide)
- Characterization of uncertainty
- Campaign data exist to look at dust in various locations
- Can we derive kappa at various locations?
- Not all kappa’s are the same (CCN vs. TDMA) – consistent method required
  - very high RH
- Closure studies needed
- Relate kappa formulation to composition (size resolved)
- Look at chemical information as related to kappa
- Quantify uncertainties for remote sensing retrievals in campaigns
- Utilize SGP Raman lidar and surface measurements to look at \( f(\text{RH}) \) in column
- Rain/snow collection? Look for aerosol information, water isotopes
Possible focus groups

1. Synchronization of aerosol measurements with model needs
   (example – kappa formulation)
   Location – SGP, Azores and other locations
   • surface measurements and remote sensing
   • controlled lab studies for specific aerosols, need to relate to actual ambient aerosols
2. aerosol absorption – more complete coverage of spectrum
   – start focus in UV? thermal IR? Focus on GVAX?
3. QME for assessing aerosol models – aerosol testbed
   • what are most pressing needs, low hanging fruit – need participation and input from modelers
   • prognostic variables from models
   • parameterizations
   • ongoing closure studies
Breakout Discussion

– Develop future field studies
  – GVAX – how can the measurements be best utilized to study aerosol optical properties?
  – What aerosol properties, distributions, processes should be addressed in future field missions?

– Controlled burning –
  • characterize sources and products
  • SOA vs. burning products

– Power plant studies – look farther downwind
  • Ex. Four corners