Future approach

Basic

How can observation and modeling researchers have interactions with each other? We need more!

Technical 1

Definitions, terminologies, etc.

Do we need any novel standard or reference for aerosol research by using electron microscope?

Do we need field observation or experiment as an intercomparison to construct common dataset?

Do we need intercomparison with other aerosol measurement techniques?

Technical 2

Shall we plan 2nd international meeting on aerosol research using electron microscope?

Shall we start an activity for getting a research fund in the near future?

Y. Igarashi (MRI)
Bridging Microscopy & Models

“Good models need good measurements.”

• Thanks to JEOL and OXFORD, STEM no longer requires patient microscopists (near turn-key instrument).
• It is cheaper to send ready-to-use impactors around than installing state-of-the-art TOF-AMS in every GAW station.
• Standardize sampling and analysis protocols for parameterizing “internal mixing states” directly applicable to models (e.g. Kappa for hygroscopicity).
• Build a global data archive of internal mixing ratio of Soot (BC) with Sulfate, OC, etc.
• Further communication of microscopist and modelers needed.

Who can manage this???
Requests from Modelers

What do modelers want to know?
- Mixing states of aerosols with their size and chemical compositions
- Morphology of aerosols (spherical or aggregate)
- Representativeness (need a number of samples)

What TEM measurements do modelers want?
- Spatial and temporal characteristics of the aerosol properties from source to remote regions
  - Emission types (anthropogenic and biomass burning)
  - Vertical distributions (PBL and FT)
- Mixture of fine and coarse particles (e.g., BC and dust)
- Simultaneous measurements with other instruments

The above information is helpful for treatments of aerosols in models. (Aerosol representations, emissions, microphysics, radiations, etc.)
Thoughts & goals for the future

Use accurate and appropriate particle data in climate models

For example, produce models of “black carbon” that match the shapes and configurations that are actually observed

Reconcile measurements of individual particles with those from remote sources such as aircraft and satellites

The people and facilities at MRI seem to make this an ideal place for such research advances

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Thank you very much for inviting me to this very interesting and promising symposium!

P. R. Buseck (ASU)