Aerosol components/types: what are they and how useful are they? – viewpoints from a modeler

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"Aerosol types" or "components" are ambiguous terms that can have multiple definitions. They may be inferred by origin of aerosols (e.g., aerosol originating from fossil fuel combustion, biomass burning, desert, etc.), speciation (e.g., sulfate, nitrate, dust, black carbon (BC), etc.), or particle size (e.g., fine mode, coarse mode). Additional definition of type may include absorbing ability (e.g., BC, brown carbon (BrC), non-absorbing aerosol), or water affinity (e.g., insoluble, soluble, hydrophobic, etc.). Currently, several remote-sensing based estimates of aerosol components/types are available, including aerosol subtypes from CALIOP, aerosol components from POLDER/GRASP, and absorbing aerosol components from EPIC/MAIAC.

In this presentation, we use the NASA GEOS/GOCART simulated aerosol information, including aerosol composition from different source sectors, aerosol physical properties (e.g., soluble, insoluble, fine and coarse mode), and absorbing aerosol components (e.g., BC, "BrC", FeOx), to compare with those derived from satellite retrievals to assess (1) what are the major consistency/inconsistency between the model-determined aerosol components/types with those from satellite-derived quantities, (2) how the information of aerosol components/types from satellite can be used for model improvements, and (3) how models can help satellite teams improve their classification of aerosol components and types.

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