

# Deliverable D4: Development & Evaluation of MOSAIC-mix

**Objective:** Develop MOSAIC-mix, a version of MOSAIC tracks evolution of aerosol mixing state with a novel 3D bin structure that resolves size, hygroscopicity, black carbon fraction. Evaluate box-model version using chamber data on soot aging. Implement into WRF-Chem and test with CARES and TCAP field campaign data.

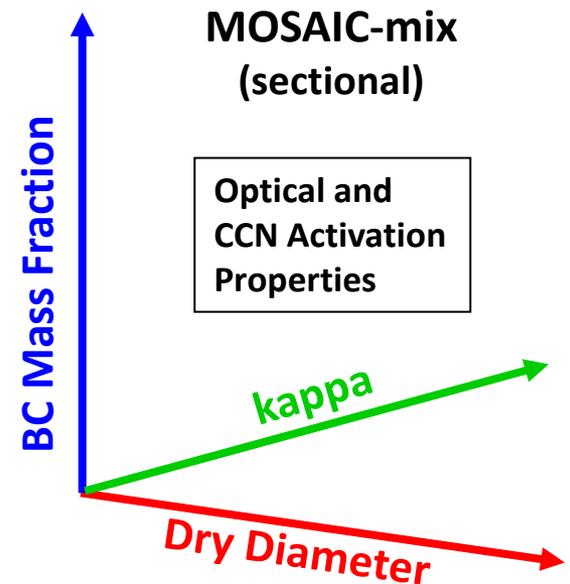
**Lead personnel:** Rahul Zaveri, Richard Easter, Jerome Fast

**Collaborators:** Nicole Riemer and Matt West

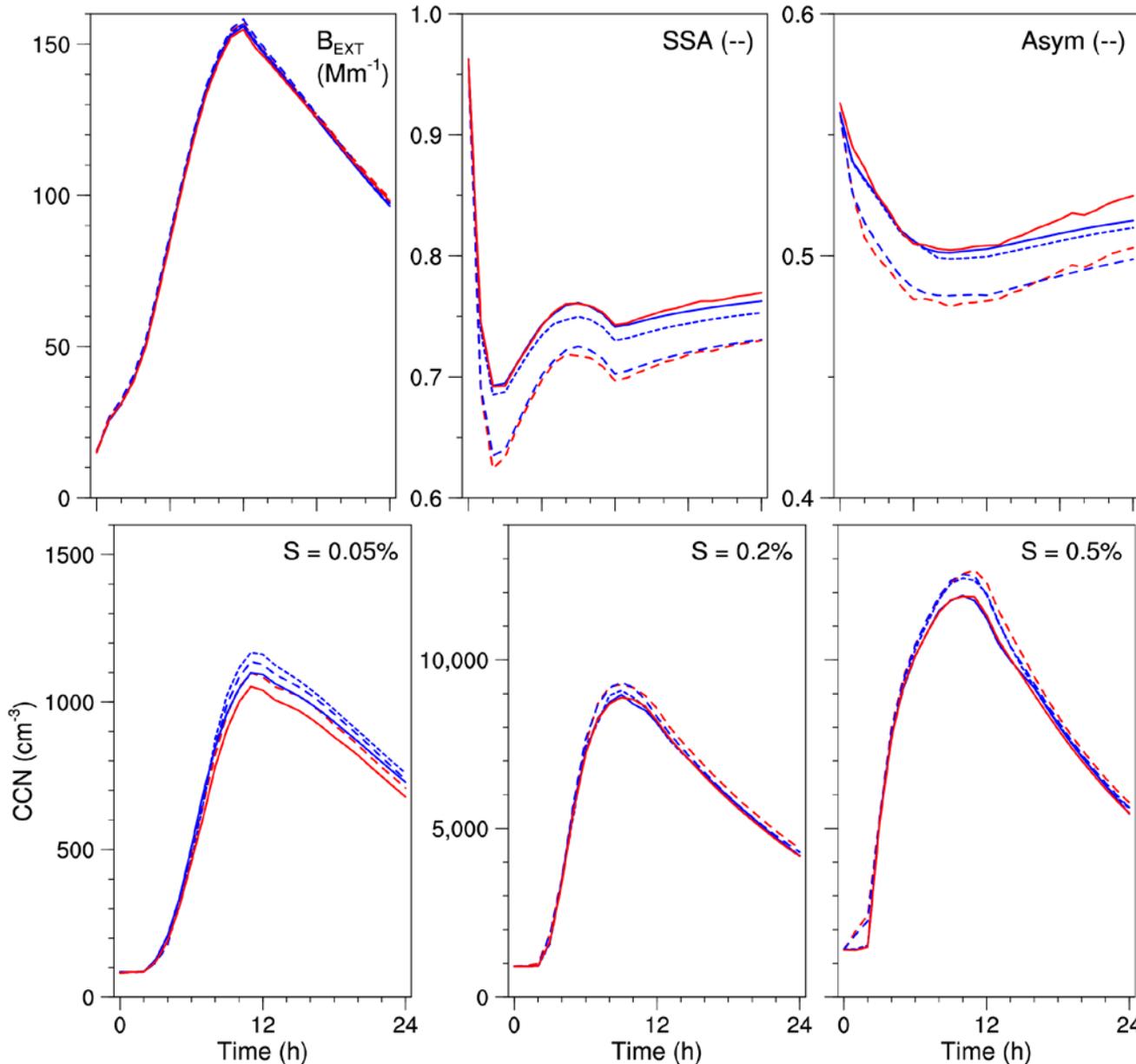
**Challenges:** Mixing state evolution is sensitive to SOA formation, phase state, and size distribution evolution, which are poorly constrained in existing models. Need to engage with SOA Formation as well as Light Absorbing Aerosol focus groups to properly constrain and evaluate mixing state representation.

**Funding status:** funded, work in progress

**Goal:** The project aims to produce a computationally efficient sectional mixing state model optimized using real-world observations.



# Preliminary Results for an Idealized Plume Scenario



- PartMC
- - - PartMC binned 24x1x1
- Sectional 24x3x3
- - - Sectional 24x2x2
- . - Sectional 24x1x1

**Field observations show much greater errors in CCN concentrations when internally-mixed aerosols are assumed (e.g., Cubison et al. 2008).**

**Need to evaluate and optimize MOSAIC-mix using lab and field observations.**