

Aerosol Wet Removal breakout (8:30-10:00am, November 6)

1. Wet Removal without Surface Precipitation: the Importance of Weakly Drizzling Clouds for Controlling Cloud Condensation Nuclei (**Rob Wood**)
2. In-Situ Characterization of Cloud Condensation Nuclei, Interstitial, and Background Particles (**Alla Zelenyuk-Imre**)
3. Wet Scavenging and Replenishment of Aerosol in the Warm MBL (**Jan Kazil**)
4. A Few Small Steps for the Parameterization of Wet Removal: Improved Treatment of Cloud-Aerosol Interactions in WRF-Chem (**Larry Berg**)
5. Dry and Wet Removal of Organic Compounds (**Alma Hodzic**)
6. Aerosol Wet Removal in Deep Convective Clouds (**Hailong Wang**)

Main points addressed in the presentations and related discussion

- CCN loss to coalescence scavenging in weakly precipitating clouds is significant and important in setting ‘background’ drop number in remote MBL;
- Removal of aerosols also determines the replenishment processes (e.g., new particle formation) in MBL; challenges remain in models (even LES) to accurately represent entrainment
- Measurements of free-tropospheric CCN and rain rates are needed to close the CCN budget model to predict Nd in MBL; rain rates can be quantified with ARM radars.
- In-situ measurements (SPLAT II, CPC, CVI) of interstitial aerosols and cloud drop residuals from ISDAC warm clouds show minimal difference in particle composition, and particle size is the controlling factor for aerosol activation

Main points addressed in the presentations and related discussion

- New model developments (i.e., cumulus parameterization, cloud-ice-borne aerosols, ...) in WRF-Chem to improve cloud-aerosol interactions have important impact on aerosol wet removal in convective clouds and aerosol vertical distribution, but data from existing campaigns (e.g., CHAPS, TCAP, DC3) are generally not sufficient for process-level studies of wet removal and to guide more accurate representation in models
- Removal of SOA is important but has received little attention; measurements of dry/wet deposition of organic vapors and particles are needed to verify models but are very limited
- S. Madronich (NCAR) proposed to have measurements of aerosol including organic compounds in surface rain water at ARM sites (e.g., SGP?)

General science questions

- What measurements can be used to identify the attributes of aerosol and clouds that control scavenging, and how well are the attributes represented in models?
- What measurements are needed, but cannot be obtained from existing field campaigns, to further evaluate and better represent aerosol wet removal in global models?
- How important are the changes to aerosol number, size, mixing state and vertical distribution through scavenging followed by resuspension in various types of clouds?



More input, suggestions?

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