

# Future Needs in Climate Modeling: Aerosol-Cloud Interactions, Addendum

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ACE Science Working Group Meeting  
20 June 2008

# Look to CRMs for Data Needs

- resolution
  - stratocumulus (low clouds):  $\Delta x = 50 \text{ m}$ ,  $\Delta y = \Delta x/2$
  - deep convection (high clouds):  $\Delta x = 250 \text{ m}$ ,  $\Delta y = \Delta x$

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    - not mechanistic (GCCN, turbulence)
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    - cloud-base Sc precipitation  $\propto (LWP/N_d)^{7/4}$
    - $LWP$ ,  $N_d$  (from  $R_{eff}$ ?),  $N_a$  (from dry aerosol NSD)
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    - $\rightarrow$  suborbital program: sub-cloud aerosol, dynamics (ARM?)

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    - $\rightarrow$  suborbital program: sub-cloud aerosol, dynamics (ARM?)
  - deep convection (hydrologic cycle)
    - $LWP$ ,  $IWP$ ,  $N_d$ ,  $N_i$ ,  $N_a$
    - $\rightarrow$  HSRL + scanning radar for convective coverage
    - $\rightarrow$  weaker suborbital program: thermodynamics, waves