Why do GCMs overestimate the aerosol cloud lifetime effect? A comparison of CAM5 and a CRM

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- Figures S1,S2,S3
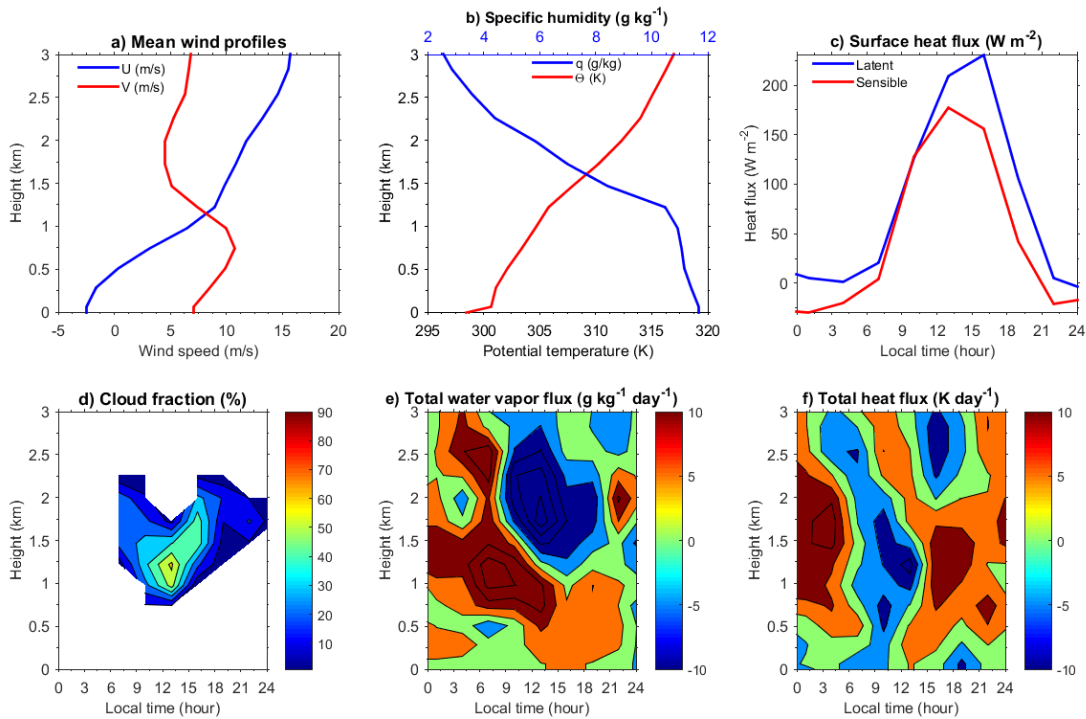
Figure S1. (a) Mean observed wind profiles from 10:00-19:00 (local time) on May 27th, 2011. (b) Mean observed potential temperature and specific humidity profiles from 10:00-19:00 (local time) on May 27th, 2011. (c) Observed surface latent and sensible heat fluxes. (d) Observed cloud fractions. (g) Total advected (horizontal+vertical) water vapor flux and (f) heat flux from the objective variational analysis (*Xie et al.* 2014).
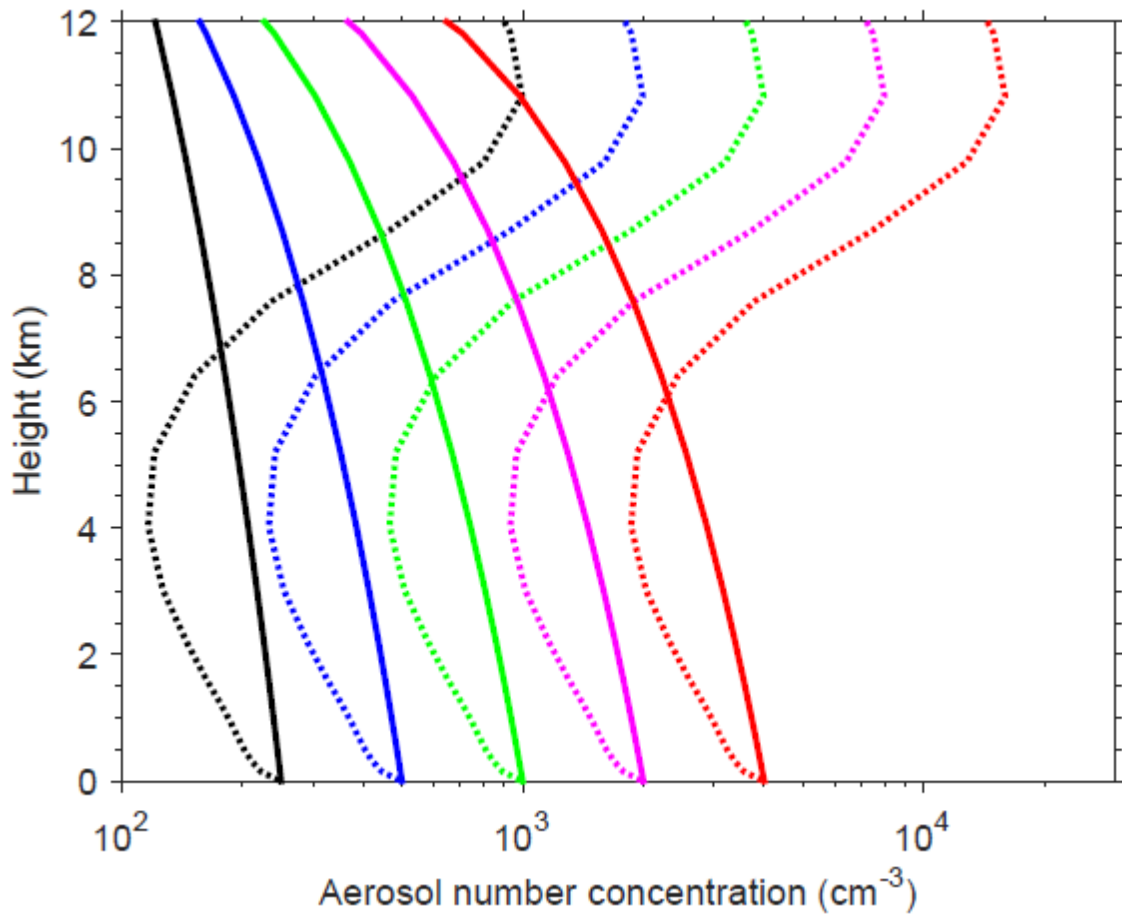
Figure S2. Profiles of aerosol number concentation used in the CRM (solid) and CAM (dotted) with five different surface number concentrations (250 cm^{-3}, 500 cm^{-3}, 1000 cm^{-3} , 2000 cm^{-3} and 4000 cm^{-3}).
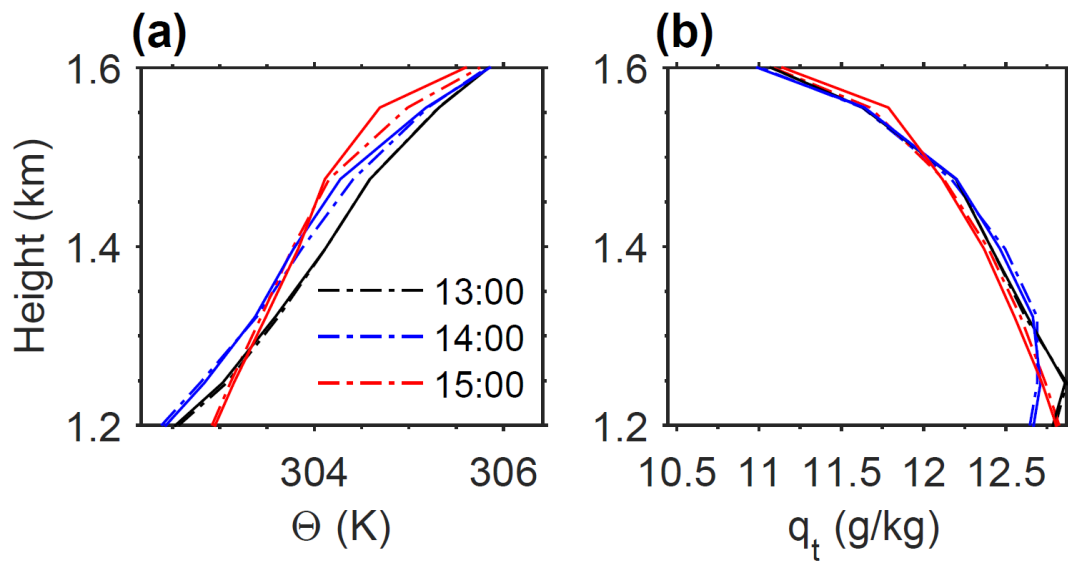
Figure S3. An enlarged portion of Fig 2a and 2b showing the (a) domain averaged potential temperatures (θ) and (b) total water specific humidity (q_t).

References are listed in the manuscript.