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Results from Simulations for the AMMA (2006) Special Observing Period of August 6-7 using the Aerosol-Cloud Microphysics-Radiation Coupling in NASA Unified WRF

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It is well known that aerosols in the atmosphere often serve as condensation nuclei in the formation of cloud droplets and ice particles. As a result, these aerosols acting as condensation nuclei exert considerable influence on the microphysical properties of both warm and ice clouds. Recent research efforts have led to notable progress in increasing our understanding of their microphysical properties and the factors that enable them to act as cloud condensation nuclei and ice nuclei and therefore the indirect effects on cloud formation. On the other hand, these same aerosols also have a direct effect on how longwave and shortwave radiations are absorbed in the atmosphere and consequently the heating in the atmosphere and at the surface. Given the complexity of aerosol effects on cloud microphysics and radiation and their subsequent effects on deep convective clouds, there is also a need to assess the combined aerosol effects of microphysics and radiation. In this latest model development, the Goddard microphysics and longwave/shortwave schemes in NASA Unified WRF are coupled in real-time with the Goddard Chemistry Aerosol Radiation and Transport (GOCART) in WRF-Chem to account for the direct (radiation) and indirect (microphysics) impact. Results from the recent simulations for the AMMA (2006) special observing period August 6-7 using the newly developed coupling will be presented.