



simplified aerosol representations in global modeling

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The detailed treatment of aerosol in global modeling is complex and time-consuming. Thus simplified approaches are investigated, which prescribe 4D (space and time) distributions of aerosol optical properties and of aerosol microphysical properties. Aerosol optical properties are required to assess aerosol direct radiative effects and aerosol microphysical properties (in terms of their ability as aerosol nuclei to modify cloud droplet concentrations) are needed to address the indirect aerosol impact on cloud properties. Following the simplifying concept of the monthly gridded (1x1 lat/lon) aerosol climatology (MAC), new approaches are presented and evaluated against more detailed methods, including comparisons to detailed simulations with complex aerosol component modules.