



The effect of organic aerosols from SOA formation on estimates of the aerosol indirect effect

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The study of atmospheric aerosol is important for its impact on clouds and climate. Recent experimental findings indicate that Secondary Organic Aerosol (SOA) represents an important and, under many circumstances, the major fraction of the global aerosol burden. In spite of realizing the importance of SOA, most of the current global chemical transport models tend to underestimate the levels of SOA compared to those measured in field campaigns. We use a 3-d global model (IMPACT) to test the results of different mechanisms for the production of SOA. The mechanism includes SOA formation from organic nitrates and peroxides produced in an explicit chemical formulation. Partition coefficients are derived based on thermodynamic principles. We also include the formation of non-evaporative SOA from the reaction of glyoxal, methylglyoxal and epoxides on aqueous aerosols. The above mechanisms are evaluated by comparison with measurements, and the effects of including these formation mechanisms on the first aerosol indirect effect are evaluated. We show that the inclusion of a full mechanism for SOA formation lead to an important reduction in the estimates of the aerosol first indirect effect.