P71 Reassessing SOA growth and removal in WRF-Chem based on explicit chemistry

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Current secondary organic aerosol (SOA) parameterizations fail to explain the observed amounts and properties of tropospheric SOA, which results in large uncertainties in their effect on radiation and climate. We use the Generator of Explicit Chemistry and Kinetics of Organics in the Atmosphere (GECKO-A) to simulate SOA gas-phase chemistry in various environments (urban, forest, low/high NOx). Our results show that GECKO-A predicts significant SOA mass growth in urban plumes, and formation of less volatile and more soluble organic products, than predicted by parameterizations typically used in 3D models. We derive new parameterisations that reproduce GECKO-A behaviour in terms of volatility, yields and solubility for use in 3D models. These parameterizations are included within WRF-Chem and applied over the conteinental U.S. to reassess SOA concentrations and removal. In particular, model simulations suggest that dry and wet deposition of condensable organic vapors mediates SOA loss, decreasing surface concentrations in the USA by ~60% for biogenic and ~45% for short-chain anthropogenic precursors, under the volatility conditions considered.