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Abstract:

Ground level ozone continues to be a problem in the Eastern United States as well as East Asia. We present a compilation of recent studies demonstrating how photochemistry and meteorology conspire to generate high levels of secondary pollutants (ozone and aerosols) on regional and local scales. In situ observations from the surface and aircraft as well as remotely sensed data are used to constrain and improve numerical simulations performed with CMAQ and CAMx. We demonstrate improvements in emissions (vehicular NOx) chemical mechanisms (the removal of alkyl nitrates) and vertical transport (high resolution WRF meteorology) that bring model results closer to observations and provide guidance for abatement strategies in the Mid Atlantic States. These are contrasted with the chemistry and meteorology of central China. Results provide insight into the most effective means of improving air quality.