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Modeling and Remote Sensing of the 2008 Kasatochi Eruption

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The eruption of Kasatochi in 2008 injected large quantities of ash and sulfur dioxide into the atmosphere. Here, we modeled this eruption for both of these species using the Weather Research Forecasting with Chemistry (WRF-Chem) model. The simulation includes the first 5 days of the eruption, April 7-12, covering ash and sulfur distribution throughout the continental United States and Canada. The analysis includes comparisons of sulfur dioxide and ash measurements from various remote sensing instruments, including MODIS and OMI. Model results for sulfur dioxide demonstrate a 7 day e-folding time with concentrations agreeing best when the model is initialized with 1.75 Tg of sulfur dioxide. Spatial and temporal distribution as well as concentration agreement between the model output and remote sensing is discussed. A quick synopsis of atmospheric sulfur dioxide chemistry and ash particle size distribution is also included.