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CAM-Chem model evaluation of the emissions and distributions of VSLS using TOGA observations over the eastern and western tropical Pacific Ocean

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The bromine budget in the stratosphere is impacted significantly by the emissions and transport of very short lived halogenated species (VSLS) from the tropical marine boundary layer (MBL) to the stratosphere. Two recent airborne field campaigns using the NSF/NCAR Gulfstream-V, the Tropical Ocean tRoposhere Exchange of Reactive halogen species and Oxygenated VOC (TORERO; Jan-Feb 2012) and the CONvective TRansport of Active Species in the Tropics (CONTRAST; Jan-Feb 2014), have provided an excellent opportunity to evaluate VSLS emission inventories within the Community Atmosphere Model with chemistry (CAM-Chem) using airborne observations of VSLS spanning from the MBL to the upper troposphere over both the eastern and western tropical Pacific Ocean. The NCAR Trace Organic Gas Analyzer (TOGA), a fast gas-chromatograph/mass spectrometer capable of simultaneously measuring 50+ trace gases including DMS and several key brominated VSLS with sub-pptv detection limits, was deployed on both these field campaigns. Significant differences in the emissions and distributions from the eastern and western tropical Pacific were observed. Early comparisons of the CAM-Chem model results (at several horizontal resolutions) along the flight tracks to the TOGA observations in both regions show remarkable agreement for many species, while also indicating aspects of the model that needed improvement. We will show results that examine the choices for model VSL halogen gas-phase and heterogeneous chemistry, emission inventories, and horizontal resolution.