

## **Trace gas sources and distributions in the tropical troposphere and TTL**

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The recent CONTRAST, ATTREX, and CAST missions have provided a unique data set to examine the vertical distributions and transport of trace gases in the tropical West Pacific atmosphere. Trace gas measurements from the marine boundary layer to near 19 km are being used to characterize how the chemical composition of the tropical atmosphere varied due to emissions, convective redistribution, and longer scale vertical and horizontal transport processes. In addition to profiling the troposphere, we obtained multiple profiles of trace gas composition across the tropical tropopause layer (TTL). Prior to these missions, a relatively few in-situ trace gas profiles in the TTL had been made, with none in the tropical West Pacific region during boreal winter season. These profiles are impacted by transport and mixing, air mass source region, recent convection, and chemical loss. A variety of tracers of different lifetimes and sources were measured that provide insight into these various processes. The trace gases that we measured included non-methane hydrocarbons, organic nitrates, sulfur compounds, and a range of organic halogenated hydrocarbons from both biogenic (mainly marine) and anthropogenic sources. Importantly, the measurement of halogenated compounds in TTL define the input of reactive halogen into the lowermost stratosphere, with subsequent impact on ozone production and loss rates. The presentation will examine some of the details of the correlations and vertical distribution and variations of trace gases during the recent missions.