TR2Ex Measurements of the Hunga Tonga-Hunga Ha'apai Eruption Plume

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The 15 January 2022 Hunga Tonga-Hunga Haʻapai (HTHH) eruption led to the Tonga volcano Rapid Response Experiment (TR2Ex) deployment to the Maïdo Observatory in La Réunion (21°S, 55°E). From 21 to 25 January 2022, a suite of balloon-borne in situ stratospheric measurements included sulfur dioxide (SO2), aerosol, ozone, and water vapor complemented by remote sensing observations from ground-based lidar. Four balloon soundings measuring SO2 passed through the HTHH eruption plume at altitudes ranging from 19 to 30 km. The balloon-based in situ SO2 measurements of the HTHH volcanic plume were the first of their kind for a stratospheric volcanic eruption. The first two soundings on 21-22 January occurred in a dense water vapor-rich part of the HTHH plume and had lower SO2 to aerosol extinction ratios than the last two profiles on 24-25 January. Profiles on 21-22 January showed ozone depletion in the HTHH plume, with less than 10% of the observed decrease in ozone signal due to SO2 interference.

References

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