Observational instrument captures produced gas of Tonga eruption

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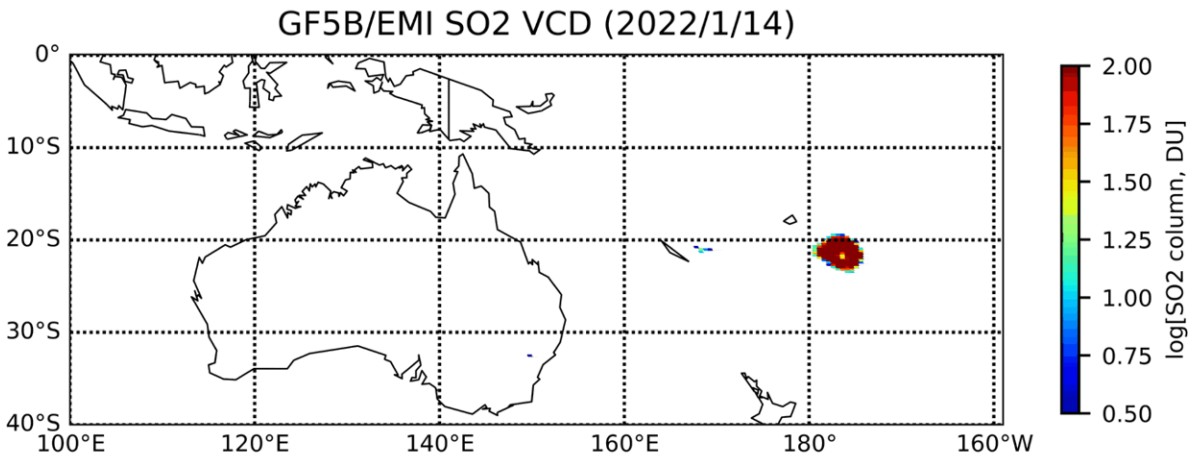

Data captured by EMI showed a high concentration of SO2 above the eruption vent after the first explosion. Credit: HFIPS

A huge plume of ash, steam and gas rising up high from the underwater near Tonga drew attention around the world on January 14, just two weeks after the beginning of 2022.

The communication from Tonga to the outer world was cut off immediately after the volcano eruption, and the devastating explosion

was captured by satellites orbiting the earth. The explosion may not be the one impacting the planet the most, "but to witness it with the modern array of instruments we have is truly unprecedented," said Lori Dengler, an emeritus professor of geophysics at Humboldt State University in California.

The environmental monitoring instrument (EMI) developed by the Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences on the Hyperspectral Observation Satellite is among the modern observation instrument arrays. The wide field of view covering the entire earth in just one day enabled the instrument to send its observations data of sulfur dioxide (SO_2) distribution very shortly after the eruption.

The data showed a high concentration of SO_2 above the eruption vent after the first explosion. Just one day later, the west-toward movement of SO_2 alongside the upper airflow was captured by HFIPS's EMI and the gas arrived to the skies above Australia on January 17. The SO_2 from the eruption did not stop, reaching the skies of northwestern Australia on January 19.

SO_2 is one kind of the gases produced when volcanoes erupt and is useful in evaluating the impact of eruptions on global climate. EMI is the only Chinese orbital observation instrument on the hyperspectral observation satellite.

Weeks have passed and scientists from around the world are still trying to better understand the massive explosion. EMI remains orbiting, and observations of the produced gas continue.

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