

Response of the Schumann resonator to the eruption of the underwater volcano Hunga Tonga–Hunga Ha’apai.

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The eruption of the underwater volcano Hunga Tonga–Hunga Ha’apai (20°34' S, 175°22' W) in the southwestern part of the Pacific occurred on January 15, 2022 at 04:14:45 UT. The rise of the volcanic cloud was accompanied by strong thunderstorm activity. According to the world’s lightning registration networks, the number of discharges during the main phase of the eruption (about two and a half hours) exceeded 400,000. The maximum discharge activity was reached approximately 45 minutes after the start of the eruption (at 05:00 UT) and the amount of lightning exceeded 5000 discharges per minute.. This is about 2 times more than the average thunderstorm activity throughout the Earth. Since 2011, geophysical observatory (GFO) "Mikhnevo" has been continuously recording magnetic field variations in the ELF range - from 0.001 to 120 Hz. The paper presents the reaction of the Schumann resonator (SR) to this eruption, according to the data obtained in the GFO "Mikhnevo". During the eruption, the amplitude of the first three SR modes increased by a factor of 2–2.5 compared to the background values. We compared the SR parameters with the thunderstorm activity in the cloud according to the GLD360 lightning detection network and the cloud rise height according to the GOES satellite imagery data. It is shown that, in general, the SR amplitude correlates well with thunderstorm activity in the cloud. At the same time, there are a number of features that do not yet have an adequate explanation. In particular, there are short variations in the SR amplitude, which do not correlate with the number of lightning discharges. The frequencies of the first three SR modes practically did not react to this event.