The effect of acoustic-gravitational waves during the eruption of the Tonga volcano on the concentration of microparticles in the surface layer of the atmosphere of Moscow

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The data of instrumental observations made at the Moscow Geophysical Monitoring Center of the IDG RAS during the explosive eruption of the Hunga-Tonga Hunga-Haapai volcano are presented. The eruption occurred on 15.01.2022 at 04:10 UTC (https://www.gismeteo.ua/news/stihiynye-yavleniya/38966-izverzhenie-vulkana-vozle-tongaprivelo-k-tsunami-v-amerikanskom-samoa/). It is known that the explosion of volcanoes causes powerful wave disturbances in the atmosphere, which can spread for tens of thousands of kilometers. Measurements of variations in geophysical fields were carried out by a measur-ing complex consisting of: Sensirion SPS30 optical solid particle sensor; Davis Instruments Vantage Pro2 weather station and MB-03 microbarometer. In the period from 15.01.2022 to 16.01.2022, noticeable variations in atmospheric pressure and intense acoustic-gravitational waves (AGW) were recorded. Thus, on 15.01.2022 at $\sim$ 18:30 UTC, an acoustic-gravitational wave with an amplitude of $\sim$ 260 Pa and a duration of $\sim$ 70 minutes was recorded, which propa-gated at a speed of $\sim$ 310 m/s. On 16.01.2022. At $\sim$ 2:25 UTC, an acoustic-gravitational wave was registered, formed as a result of convergence at the antipode point, a straight wave and a wave coming from the opposite direction. The amplitude of the wave is $\sim$ 230 Pa, the duration is $\sim$ 80 minutes, and the propagation velocity is $\sim$ 308 m/s. Such acoustic-gravitational waves are analogous to a two-dimensional Lamb wave with a source at the epicenter of the explosion and propagate along the Earth's surface. The propagation of such AGW in the lower atmosphere is accompanied by radiant heat exchange and the effects of increased turbulence. This can be accompanied by the formation of inhomogeneities in the surface layer of the atmosphere, which leads to the disturbance of local geophysical fields. Thus, during the passage of a direct acoustic-gravitational wave and an antipodal one, an increase in the concentration of micropar-ticles in the air was recorded. There is a good temporal correlation between AGV and variations in the concentration of microparticles.