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Short-term variations of diffuse CO2 and H2S at the summit crater of Teide volcano, Tenerife, Canary Islands

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Tenerife (2,034 km^2) is the central and largest island of the Canarian archipelago, located about 100 km west of the African coast between 27º37’ and 29º25’N and between 13º20’ and 18º10’W. The structure of Tenerife is controlled by a volcano-tectonic rift-system with NW, NE and NS directions with Teide volcano located in the intersection of the three rifts. Teide is the highest stratovolcano in the Atlantic Ocean reaching 3,718 m.a.s.l. with its last eruption occurred in 1798 through an adventive cone of Teide-Pico Viejo volcanic complex. Persistent degassing activity, both visible and diffuse, takes place at the summit cone of the volcano, being the diffuse degassing the principle degassing mechanism of Teide (Mori et. al., 2001; Pérez et. al., 2013). As part of the volcanic monitoring program of INVOLCAN in Tenerife, 8 surveys were performed during summer 2019 in order to evaluate the short term variations of diffuse CO_2 and H_2S emissions in the summit crater. The emissions were calculated using data from 38 sampling sites homogeneously distributed inside the crater covering an area of 6,972 m^2 by means of a portable CO_2 and H_2S fluxmeter using the accumulation chamber method (Parkinson 1981). During the study period, CO_2 and H_2S emissions ranged from 33 ± 5 to 93 ± 25 t/d and from 0.6 ± 0.2 to 4 ± 0.1 kg/d, respectively. Despite the small changes observed in the temporal evolution, values are considered normal for a quiescence period in Teide volcanic system. Short term variations in CO_2 and H_2S emissions indicate changes in the activity of the system and can be useful to understand the behaviour of the volcanic system and as forecast of future volcanic activity.

References

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