

Monitoring of seismic activity during 2013-present at Volcán de Colima, Mexico

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Keywords: seismic monitoring, volcanic monitoring, lava dome growth, lava dome collapse, seismicity

Volcán de Colima is an andesitic volcano and is located in the Western part of Mexico, between the states of Jalisco and Colima, it is considered the most active in Mexico. On 3rd January 2013, a new period of activity started at Volcán of Colima, with the occurrence of LPs, HFs and proximal VTs under the crater. An exponential growth of the continuous seismic signal of nearest station was observed during the next three days. Finally, a moderately-sized vulcanian explosion occurred with pyroclastic flows emplaced mainly to the West. Then, effusive and explosive activity continued during 2013 and 2014. In July 2014, a new pulse of magma generated a new lava dome growth with lava flows. In early 2015, explosive activity was present and in May a new lava dome growth was observed. In July 2015, a new batch of magma raise to the surface and 3 different lava flows were observed. On 10th and 11th July, two lava dome collapses occurred and generated pyroclastic flows until 10.3 km of distance. Then, the explosive activity continued to the present day with a small lava dome growth in February, 2016. As part of the seismic monitoring, the seismic events have been classified of automated way with a program based on Hidden Markov Models (HMMs). Also the energy of each explosion is calculated, until the present day 10,232 explosions have released 3.2×10^{10} Joules. Locations of rockfalls, explosions and tremor have been localized using the decrease of the amplitude, the lava dome collapses in July 2015 were also localized with this method. Some VLPs are present in the major explosions, with the particle motion, the VLPs have been localized. In the last years, the seismic monitoring at Volcán of Colima have demonstrated be a good tool for the forecast of the volcanic activity.