Comparison of past and recent seismicity in the Ceboruco Volcano, western Mexico

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Seismicity from 2003 to 2008 [1 Seismic station]
(Rodríguez-Urrej et al., 2015)

Seismicity from 2011 to 2015 [4 Seismic stations]
(Rodríguez-Ayala, 2017)

Seismicity from Nov 2016 to July 2017 [11 Seismic stations]

As a part of the “PRAG (exploración sísmica pasiva y magnetoestática) en la comarca geodinámica del volcán Ceboruco y de Colima de la Sierra Primavera” project, we installed a temporary network with 11 stations at and near the volcano (Rodriguez-Ayala et al., 2017). The network consists of 3 free-field stations and 3 stations with InSAR interferometric capability. Each station was equipped with 3-component instruments (Komet) and a level to obtain accurate coordinates of the volcano.

At the moment, we are just beginning to analyze the data obtained from the 11 seismographs. The data are being recorded every 3.5 days, and at least one event is registered within the first week of recording every 3.5 days. These data should provide a better understanding of the seismic activity of the volcano over the past 11 years.

Ceboruco volcano (19.1°N, 100.7°W, 2980 m asl) is the only historically active volcano near the western end of the Mexican Volcanic Belt (Volcanismos Estructurados, Global Volcanism Program). A chain of its relatively small, stratovolcanic cones, Ceboruco has produced thick ash flows and calderas forming explosive eruptions. Four stages of activity, herein named stages 1 through 4, have been suggested on the basis of explosivity and composition variability of erupted products (Núñez et al., 1995; Nelson, 1995; Suárez, 1998).

Stage 1: During this early stage, the “Pepiiede” debris flow dominated. It was followed by pyroclastic flows triggered by the collapse of the volcano’s collapse in 1550 AD. This stage includes the recent activity, which generated fresh lavas in the interior caldera, two dacitic lava domes, and the first ash-flow deposit in the volcano’s history. This activity was followed by dacite lava flowing down the southwestern slope and covering the dacitic pyroclasts on the southwestern slope.

Stage 2: The eruption continued into the early part of 1995, generating intense pyroclastic flows, which fed both the pyroclastic flow and the pyroclastic surge. This activity was followed by dacite lava flowing down the southwestern slope, covering the dacitic pyroclasts on the southwestern slope.

Stage 3: The pyroclastic flow continued into the late part of 1995, generating intense pyroclastic flows, which fed both the pyroclastic flow and the pyroclastic surge. This activity was followed by dacite lava flowing down the southwestern slope, covering the dacitic pyroclasts on the southwestern slope.

Stage 4: The eruption continued into the early part of 1995, generating intense pyroclastic flows, which fed both the pyroclastic flow and the pyroclastic surge. This activity was followed by dacite lava flowing down the southwestern slope, covering the dacitic pyroclasts on the southwestern slope.