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## **A Magmatic intrusion near Volcan Tancítaro? Evidence from seismic analysis.**

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Between May and June 2006, an earthquake swarm occurred near Tancítaro volcano (México), which was recorded by a temporary seismic network known as MARS. We located ca. 1,000 events from this seismic swarm. Previous earthquake swarms in the area were reported in the years 1997, 1999 and 2000. We relocated and analyzed the evolution and properties of the 2006 swarm employing a waveform cross-correlation-based phase picking technique. Hypocenters from 911 events were located and divided into eighteen families having a correlation coefficient at or above 0.75. Moreover, 90% of the earthquakes provided at least sixteen phase picks and we used the single-event method in Hypo71 and the P-wave velocity model of the Jalisco Seismic and Accelerometer Network in order to improve hypocenters based on the correlation-adjusted phase arrival times. We relocated 121 earthquakes, which show clearly two clusters, between 9-10 km and 3-4 km of depth respectively. The average location error estimates are <1 km epicentrally, and <2 km in depth for the largest event in each cluster. Depths of seismicity migrate upward from 16 to 3.5 km and exhibit a NE-SW trend. The swarm first migrated toward Parícutin volcano but by mid-June began propagating back towards Tancítaro volcano. In addition to its persistence, noteworthy aspects of this swarm include a quasi-exponential increase in the rate of activity within the first 15 days; a b-value of 1.47; a jug-shaped hypocenter distribution; a shoaling rate of ~5 km/month within the deeper cluster and a composite focal mechanism solution indicating largely reverse faulting. These swarm features suggest a magmatic source increasing the crustal strain beneath Tancítaro volcano. This event magnifies the importance of monitoring monogenetic volcanic fields.