



Explosive behaviour at Santiaguito Volcano, Guatemala, observed between November 2014 and May 2017 by a network of seismic and infrasound sensors.

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Explosions at Santiaguito Volcano, Guatemala, are known to occur regularly in a cyclic pattern, usually several times a day. Between November 2014 and May 2017, a network of broadband and short period seismic stations was deployed around the volcano. A catalogue of the explosions during this time was created through the development and application of a detection and classification algorithm. With a detection rate of 92%, the resulting catalogue contained 16,546 explosions, less than 0.5% of which are false alarms. We find that the inter-explosion times throughout the observation period is less consistent than previously thought for Santiaguito volcano, varying between 5 and 500 explosions per week. Detailed analysis of seismic traces from the explosions, along with infrasound recordings and visual observations, shows that Santiaguito volcano exhibits several types of explosions, some of which have not previously been described. A common feature observed at Santiaguito volcano are secondary explosions, which occur within 10 minutes of an initial explosion and release less than 20% the energy of the primary explosion, while being produced by the same source and following the same exit path. Over the observation period we found that the explosive baseline behaviour of Santiaguito volcano can be described by small-to-moderate explosions, with plumes rising approximately 600m above the lava dome. Changes from and to this standard regime were observed to occur over time periods from days to a year. Analysing the signatures of the explosions allow for the determination of the explosive regime and the associated hazards.