



Major effusive eruptions and recent lava fountains : Balance between erupted and expected magma volumes at Etna volcano

Alessandro Bonaccorso and Sonia Calvari

Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania, Italy (bonaccorso@ct.ingv.it)

Over the last four decades Etna has shown a high output rate through numerous eruptions. The volcano has displayed two eruptive behaviors. The first was characterized by effusive eruptions that efficiently drained the storage system and emitted large volumes of magma, the second behavior was related to lava fountains, erupting small magma batches, which are normally with high frequency and have been considered as precursors of major effusive eruptions.

We show that, if the average output rate of the volcano remains steady during the next decades and if the erupted volumes (both lava flows and pyroclastics) are regularly estimated, then we should be able to detect the phases when the balance between intruded and erupted magma is moving away from equilibrium, becoming more prone to major eruptions.

The proposed interpretation allows suggesting, for a given time frame, the volume that an on-going eruptive activity (i.e. main effusive eruption or lava fountain episodes) will emit to reach the equilibrium or that will be erupted by a potential new eruptive activity starting at that time.

In this work, we also present an updated estimation of emitted volumes from Etna eruptions, which include the 38 lava fountain episodes occurring from January 2011 to April 2013. These recent explosive episodes have been frequent, discharging significant magma volumes. Observing the steady trend of magma output over time, we present insights on expected erupted volumes. In particular, we highlight that the 2011-13 lava fountains, having efficiently drained the intermediate-shallow storage system, brought the plumbing system toward a state of equilibrium.