

Session : S2.16 What do volcano seismo-acoustic signals mean?

Title : The renewal of a lava lake activity inside Nyiragongo's crater after the 2021 flank eruption as heard by nearby acoustic and seismic sensors

Authors : J. Barrière, A. Oth, J. Subira and N. d'Oreye

Over the past decade, Nyiragongo volcano hosted the world's largest persistent lava lake, which was the source of a continuous long-period tremor detected across the local seismic network (up to ~100 km). Since the installation of infrasound sensors in 2016 at a seismic station deployed on its flank, an acoustic counterpart of this tremor was recorded, which validated the shallow source region of this lava lake's permanent signal. In particular, variations of the frequency content and amplitude of the seismo-acoustic continuous tremor brought indications about the fluctuations of the lava lake level and the intensity of the spattering/degassing, respectively. On May 21th 2021, Nyiragongo erupted on its southern flank, draining the lava lake and leading to the collapse of the inner crater down to hundreds of meters (as for the last known 1977 and 2002 eruptions), and the shallow seismo-acoustic tremor disappeared. Signs of renewal of activity inside its crater were quickly observed in the weeks/months following the eruption. In late September, the reappearance of a lava in the bottom crater was confirmed by visual and remote observations. At that time, the possible location of a seismic tremor source originating from Nyiragongo's crater over day-long records across the network was another striking sign of an intense eruptive dynamics inside its crater. Such restart of activity was also accompanied by the detection of an intermittent seismo-acoustic signal from Nyiragongo, thus recalling the past lava lake's tremor signature. Since then, several periods of intense tremor activity marked the new intracratereal activity. In this contribution, we will give an overview of the available seismo-acoustic observations following the 2021 flank eruption, which are the first ones testifying of the reappearance of a lava lake after a crater collapse at Nyiragongo.