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Seismo-acoustic characterization of the 2019 Stromboli volcano paroxysm events

Alexis Le Pichon¹, Emanuele Marchetti², Christoph Pilger³, Lars Ceranna³, Viviane Souty¹, Bruno Hernandez¹, and Constantino Listowski¹

¹CEA/DAM/DIF, DASE, Arpajon, France (alexis.le-pichon@cea.fr)

²University of Firenze, Department of Earth Sciences, 50121, Firenze, Italy

³BGR, B4.3, D-30655 Hannover, Germany

Stromboli volcano is well known for its persistent explosive activity, with hundreds of explosions every day ejecting ash and scoria up to heights of several tens/few hundreds of meters. Such a mild activity is however punctuated by lava flows and major/paroxysmal explosions, that represent a much larger hazard. On July 3rd and August 28th 2019, two paroxysmal explosions occurred at Stromboli, generating an eruptive column that quickly raised up to 5 km above the sea level. The Toulouse Volcanic Ash Advisory Center (VAAC) emitted an advisory to the civil aviation with a two-hour delay. The various processes of this event were monitored near and far field by infrasonic arrays up to distance of 3,500 km and by the Italian national seismic network at range of hundreds of kilometres. Using state-of-the-art propagation modeling, we aim at identifying the various seismic and infrasound phases of the event to better characterize the volcanic source. We highlight the need for the integration of the global infrasound International Monitoring System (IMS) network with local and regional infrasound arrays capable of providing a timely early warning to VAACs. This study opens new perspectives in volcano monitoring for hazard assessment and could represent, in the future, an efficient tool in supporting VAACs activity.