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## APPLIED RESEARCH

## STROMBOLI: THE FIRST MUON RADIOGRAPHY OF A VOLCANO

For the first time, a muography of the Stromboli volcano has been completed, the result of a collaboration between a group of researchers from INFN and from the Italian

National Institute of Geophysics and Volcanology (INGV), alongside Japanese research institutes. The results of the first muon radiography of the Stromboli volcano, which were published in the international journal Scientific Reports of Nature, revealed the presence of a low density zone in the summit area of the volcano. This zone corresponds to a sector collapse that formed in the craters' area during the effusive eruption of 2007 and, subsequently, pyroclastic material produced by Stromboli's explosive activity. filled with incoherent The muography or muon radiography is a technique that uses muons, particles that are produced when cosmic rays from space interact with the terrestrial atmosphere, to reconstruct an image of an object's internal structure. The technique is based on a similar principle to radiography, which uses X-rays, but, in comparison to this, has the advantage of being able to investigate much bigger objects, just like volcanoes, because muons are able to penetrate materials much more deeply than X-rays. The detector was positioned at the Le Roccette site, 640 metres above sea level, and collected muon traces, which traversed the volcano, for five months. Periodic radiographies of the volcano's summit may be used to monitor changes in its internal structure.