Geophysical Research Abstracts, Vol. 8, 08383, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08383

Dynamic response of Stromboli volcano to regional seismicity: inference from radon degassing

C. Cigolini (1), **S. Bertolino (1),** M. Laiolo (1), D. Coppola (1)
(1) DSMP, Univeristà di Torino, Via Valperga Caluso 35, 10125 Torino

The triggering mechanism of volcanic eruptions is linked to the problem of decoding the interplay between high-magnitude earthquakes and remotely triggered seismicity. Radon gas, besides being considered a precursor of earthquakesand volcanic eruptions, is a powerful tool to investigate diffuse degassing along faults, volcanoes and geothermal areas. At Stromboli, this has been achieved using a network of 25 stations. We investigated the dynamic response of the volcano to thee major earthquakes (with $M_L > 5$) that affected the Mediterranean region during 2002-2004.

The seismic sequence associated with the Palermo earthquake (September 6, 2002; $M_L > 5.9$) remotely triggered seismicity along the southern part of the Tindari-Letojanni fault system and prepared the ground for the eruption of Mount Etna on October 27, 2002. Increase in seismicity along this fault contributed to postseismic strain diffusionalong the Stromboli-Panarea alignment, and led to an increase in radon degassing at Stromboli that peaked during the last major eruptive cycle. Precursory radon anomalies have been recorded for the Algiers-Boumerdes earthquake (May 21, 2003; $M_L > 6.7$). These were not associated with a growth in bulk radon degassing and eruption rates since the epicenter was very far from Stromboli ($\sim$ 1120 km) and the event was not accompanied by a persisting increase in seismicity in the Southern Tyrrhenian region.

During the Salina earthquake (May 5, 2004; M_L 5.1) we monitored radon emissions at Stromboli summit stations well higher then the threshold values of 20000 Bq/m3, which have been measured 14-17 days before the beginning of the last effusive cycle (December 28, 2002) and the major explosion of April 5, 2003. Therefore, the activation of volcanic alert at Stromboli, based on radon monitoring, should take into account the possible effects of local and regional seismicity.