Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SVC12-04 会場:304 時間:5 月 26 日 15:00-15:15

Radon monitoring at active volcanoes: achievements and perspectives
Radon monitoring at active volcanoes: achievements and perspectives

CORRADO, Cigolini[1*] ; COPPOLA, Diego[1] ; LAIOLO, Marco[1]
CORRADO, Cigolini[1*] ; COPPOLA, Diego[1] ; LAIOLO, Marco[1]

[1]DST University of Torino, Italy, [2]IGS Kyoto University
[1]DST University of Torino, Italy, [2]IGS Kyoto University

Understanding the behavior of fluids in hydrothermal systems is a key factor in volcano monitoring and geothermal exploration. Moreover, measuring gas emissions in volcanic areas is strategic for detecting and interpreting precursory signals of variations in volcanic activity, including eruptions and flank instabilities of volcanic edifices.

Among gases, a very peculiar one is radon. Radon is a radioactive gas generated from the decay of uranium bearing rocks, soils and magmas. The role of radon as a potential precursor of earthquakes has been extensively debated. At this stage of knowledge, radon anomalies appear to be better suited to forecast eruptive episodes since we know the loci of volcanic eruptions and we can follow the evolution of volcanic activity. Radon mapping is also an effective tool to assess diffuse and concentrated degassing at the surface. We hereby present a collection of data on Somma-Vesuvius, Stromboli, Villaricca (Chile) and La Soufriere (Guadeloupe, Lesser Antilles).

At Somma-Vesuvius, we used a network for radon monitoring to discriminate signals produced by regional earthquakes from those derived by the local volcanic seismicity. Moreover, the duration of radon anomalies have been used, together with other geochemical and geophysical parameters, to infer the permeability of the hydrothermal reservoir and the ascent velocity of fluids. At Stromboli volcano we were able to detect earthquake-volcano interactions: radon anomalies may be coseismic, precursory, and may also occur with a time-delay in respect to the onset of major regional seismic events. In addition, automatic and real time measurements allow us to detect major changes in volcanic activity. The simultaneous collection of environmental parameters substantially increase the potential role of radon in volcano monitoring since the data are easily collected, transferred, elaborated and filtered by applying Multiple Linear Regression analysis on the radon signal. We hereby propose a methodological procedure that can contribute to improve volcano surveillance in the attempt to mitigate volcanic risk.

キーワード: radon, monitoring, diffuse degassing, volcano surveillance, volcanic risk
Keywords: radon, monitoring, diffuse degassing, volcano surveillance, volcanic risk