



Radon (^{222}Rn) soil gas measurements at Furnas Volcano (S. Miguel Island, Azores)

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Furnas Volcano is one of the three active central volcanoes of S. Miguel Island, in the Azores Archipelago. Fumarole grounds, thermal springs, CO_2 rich mineral cold waters and several soil diffuse degassing areas are the main secondary volcanic phenomena that can be seen at Furnas Volcano surface.

Radon can be an important indicator of deep events and its study can be used, mainly, in the identification of active faults, seismovolcanic monitoring and geothermal prospection.

A first soil radon survey was performed in Furnas Village between July and November 2005. A total of 175 station points were measured using a solid state alpha detector (RAD7 equipment). Soil temperature measurements were also performed at the same points. Radon measurements oscillated between 45.9 and 110808 Bq/m^3 being the average value 6702 Bq/m^3 . The temperature varied from 16.5 °C to 100 °C with a mean of 24.6 °C. The spatial distribution analysis of the data allowed to identify temperature and radon concentration anomalous zones, that were compared with the existing CO_2 soil distribution maps.

Additionally continuous monitoring of radon soil degassing was performed from August to December 2005. A RAD7 equipment was installed inside Furnas Volcano Caldera near the CO_2 soil flux permanent station site (GFUR1). In a first approach the environmental data obtained by the meteorological station coupled to the CO_2 soil flux permanent station was used to understand radon fluctuations. As it was found for CO_2 soil flux variations, barometric pressure, rainfall and soil water content seem to

be the most influencing external factors on radon concentration in the selected sampling point.