



The Piton de la Fournaise, a closely-monitored volcano

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The Piton de la Fournaise volcano at La Réunion Island in the western Indian Ocean is one of the most active volcanoes in the world, with a mean eruption rate over the last 2 centuries of more than one eruption per year. Since 1980, the IPGP, together with local authorities, installed a dense scientific and survey network based on seismic and deformation stations, SO₂ monitors, webcams and cameras in order to track minor precursors of eruptions and to distinguish between eruptive cycles.

The seismic network consists of 26 one and 3 component stations, which was extended by 16 broad band stations in the context of the “Undervolc” programme. This network is focused on the Enclos Fouqué caldera and the south-eastern Piton de la Fournaise area. Five additional broad band stations will be installed in 2011, covering the whole island.

The deformation network consists of extensometer, tiltmeter and GPS stations. Three extensometer and 7 tiltmeter stations cover the Enclos Fouqué caldera. One tiltmeter station is situated in a 10 m deep bore hole outside of the caldera on the Rempart de Bellecombe. It will be implemented in 2011 by two more bore hole tiltmeters. The GPS network consists on 5 stations around the summit craters, 5 stations at the base of the central cone and 2 reference stations outside of the caldera. Five more stations are situated in the “Grandes Pentes” and the “Grand Brûlé” area and are associated to the Undervolc programme. Three stations monitor the subsidence of the 60 m thick 2007 lava flow and two basis stations are situated in the south eastern island close to the coast. Beside this permanent GPS network we have a total of 70 stainless steel rods and tripods which were measured occasionally before (if possible) and after eruptions.

Three DOAS stations, which scan automatically the sky for SO₂ are situated on the “Enclos Fouqué” caldera rim. Four webcams transmit images of the volcano and an other one from the “Grandes Pentes”, and 2 cameras register images from the Dolomieu crater once every hour.

Seismic data and five GPS data were transmitted to the observatory in real time. Tiltmeter and extensometer data were transmitted every 5 minutes. Remaining GPS data were recovered once a day and calculated automatically. The webcams were transmitted every 1 to 5 minutes.

Transmissions of the data were performed by analogue transmission, Freewave and Wifi transmissions and Internet including a large number of relay stations due to complex topographic situation of Piton de la Fournaise.