



## **Does the landslide of the “Grand Brûlé” exist? New insights from the analysis of the submarine sedimentation of the Piton de la Fournaise volcano, La Reunion Island.**

F. Saint-Ange (1), B. Savoye (2), L. Michon (1), **P. Bachèlery** (1)

(1) LSTUR-IPGP UMR 7154, Université de La Réunion, St Denis, France, (2) IFREMER, DRO/GM, Plouzané, Brest, France (francky.saint-ange@univ-reunion.fr / Fax: 0262938266 / Phone: 0262938205)

La Réunion Island is located east of Madagascar in the southwestern part of the Indian Ocean. It is currently formed by the juxtaposition of two basaltic shield volcanoes (the Piton des Neiges and the Piton de la Fournaise) of which only the Piton de la Fournaise (PdF) is still active. The PdF is characterized by a complex morphology which origin is still the matter of debates. The topography shows steep slope zones limiting a flat summit zone and a large U-shape structure which affects the volcano summit and the eastern flank. This complex topography was previously interpreted as the result of the combination of several events such as caldera collapses and/or flank landslides. This latter interpretation was reinforced by the oceanographic surveys “Fournaise 1” and Fournaise 2” which revealed that the PdF submarine flanks are covered by many debris avalanche deposits. Bathymetric data and acoustic images indicate that these main deposits are cut by several thalwegs formed by submarine instabilities. During the “Fournaise 2” cruise, high-resolution side-scan sonar images, photographs, dredges and 14 cores were collected on the PdF submarine part. We aim at understanding the recent evolution of the submarine flanks by studying the volcanodetritic deposits. We used both the 14 cores drilled during the “Fournaise 2” cruise on which we carried out an Rx radioscapy and a new compilation of bathymetric and imagery data. The cores show a great facies heterogeneity, suggesting different transport processes and source zones. Turbiditic deposits are mainly found in confined zones and in distal areas, while volcanic sands and coarse grained materials are essentially found within the

thalwegs and near the shore. Fluvial origin deposits (coarse grains to gravels) are observed at 2700 m water depth. Their location suggests that the Osmondes paleoriver, which is filled by lava flows, was active till recently. Finally, the superficial continuous hemipelagic sedimentation indicates that the volcano did not suffer any giant landslide in the last 12000 years. This subsequently questions the formation of the large U-shape structure as resulting from a landslide 5000yr ago as previously proposed.