



The morphological evolution of the Sciara del Fuoco slope during and after the landslide triggered by the 2002-2003 Stromboli eruption

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In December 2002 the occurrence of an effusive eruption at Stromboli triggered a complex instability phenomenon which affected both the subaerial and submarine portion of the Sciara del Fuoco slope. In the following months the lava flow emplacements and the continuation of erosion processes, both along slide escarpments and on the fresh lava layers, strongly modified the slope. Periodic photogrammetric surveys performed to the end of the eruption in July 2003 permitted to directly observe and quantify the continuous morphological evolution of the Sciara del Fuoco Slope. Similar events have been observed in the last century and are reported by historical records. During the quiescent periods with respect to the episodic effusive events, the slope has shown a general tendency to re-establish a more regular shape, such as the one observed before the 2002-2003 eruption. The remodelling action is mainly obtained through erosive process of the superficial lava layers and deposition of tephra produced by the persistent explosive activity.

After the end of the eruption the photogrammetric monitoring activity was prosecuted in order to control the stability conditions of the slope, which continued to evolve showing a marked erosion especially on the lower part of the slope end toward the crater area. Furthermore, deformation processes on the accumulated lava layers were monitored at submeter level by means of a High Resolution DEM multi-temporal analysis. On the most critical areas, such as in correspondence of the head of the main landslide detached in December 2002, 3D point measurements were carried out to obtain displacement vectors at sub-decimetre accuracy.