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HR: 0800h
AN: **V21B-0607**
TI: Flank Instability Phenomena of the Sciara del Fuoco at Stromboli Volcano, Italy: Recent Evidence From a Multidisciplinary Study
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AB: The Sciara del Fuoco (SDF) at Stromboli volcano, located in the western side of the homonymous island, is a deep scar prone to phenomena of flank instability, such as rockfalls and flowing debris. By 30 December, 2002, landslides associated with tsunami waves affected both the sub aerial and submarine part of SDF two days after the onset of a new episode of lava emission. Recently, continuous monitoring as well as frequent structural field survey of SDF have provided an unprecedented opportunity for analyzing similar instability phenomena. Our study combines different data types in a complementary manner by merging geo-structural observations with visual images (taken by a video-cameras surveillance network and vertical air-photos) and seismic records. The goal of this research is to characterize this landslide-prone area for hazard mitigation purposes. The different data types are used to assess how and where SDF morphology changed in the time span from 2002 to 2004. The landslide phenomena of 30 December 2002 deeply eroded the SDF, creating a depression that in some points reached depths of several tens of meters. Afterwards, a reshape process began, through other minor erosive episodes and the deposition of lavas, which were erupted contemporaneously within a part of the collapsed/eroded zone, until the end of the eruption (21 July 2003). The effusion of lavas contributed to fill the depression, stabilizing a wide portion (more than 50 percent) of it and approaching a new gravitational equilibrium. Instead, in the zone of the landslides not reached by

the lavas, erosive phenomena have continued to the present day, as evident from the progressive regression of the erosive rim, which has approached the crater zone. These phenomena yielded several rockfalls and flowing debris. Comparative video images and seismic records analysis provides an opportunity to detect the onset of these sliding episodes in time and space, and evaluate the mechanisms of motion. Additionally, this analysis allows us to document numerous explosion quakes and Strombolian explosions conducive to shaking instability. This evidence would result from external (quantity, quality, and position of the potential sliding material) as well as internal changes (location and energy of the seismo-volcanic source) in the volcano.

DE: 7280 Volcano seismology (8419)
DE: 8419 Volcano monitoring (7280)
DE: 8488 Volcanic hazards and risks
DE: 8494 Instruments and techniques
SC: Volcanology, Geochemistry, Petrology [V]
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