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# Etna_NETVIS: A dedicated tool for automatically pre-processing high frequency data useful to extract geometrical parameters and track the evolution of the lava field

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In volcanic areas, where it could be difficult to gain access to the most critical zones for carrying out direct surveys, digital photogrammetry techniques are rarely experimented, although in many cases they proved to have remarkable potentialities, as the possibility to follow the evolution of volcanic (fracturing, vent positions, lava fields, lava front positions) and deformation processes (inflation/deflation and instability phenomena induced by volcanic activity). These results can be obtained, in the framework of standard surveillance activities, by acquiring multi-temporal datasets including Digital Orthophotos (DO) and Digital Elevation Models (DEM) to be used for implementing a quantitative and comparative analysis. The frequency of the surveys can be intensified during emergency phases to implement a quasi real-time monitoring for supporting civil protection actions. The high level of accuracy and the short time required for image processing make digital photogrammetry a suitable tool for controlling the evolution of volcanic processes which are usually characterized by large and rapid mass displacements.
In order to optimize and extend the existing permanent ground NEtwork of Thermal and VIsible Sensors located on Mt. Etna (Etna_NETVIS) and to improve the observation of the most active areas, an approach for monitoring surface sin-eruptive processes was implemented. A dedicated tool for automatically pre-processing high frequency data, useful to extract geometrical parameters as well as to track the evolution of the lava field, was developed and tested both in simulated and real scenarios. The tool allows to extract a coherent multi-temporal dataset of orthophotos useful to evaluate active flow area and to estimate effusion rates. Furthermore, Etna_NETVIS data were used to downscale the information derived from satellite data and/or to integrate the satellite datasets in case of incomplete coverage or missing acquisitions.
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