



Terrestrial Laser Scanner survey: a new system to monitor geomorphological evolution of the Vesuvius crater

Teresa Caputo (1), Renato Somma (1), Arianna Pesci (2), Antonio Pignalosa (3), Ermanno Marino (3), Claudia Troise (1), and Giuseppe De Natale (1)

(1) INGV, Osservatorio Vesuviano - Naples, Italy (teresa.caputo@ingv.it), (2) INGV, sezione di Bologna, Italy, (3) Stage srl, Marcianise, Italy

Each year the Vesuvius crater is interested by numerous landslides that are detected by seismic stations of the monitoring network of Osservatorio Vesuviano (INGV). Our aim is investigate the possible geomorphological evolution of Vesuvius crater by analyzing high resolution DTM acquired in last decade and comparing multitemporal 3D models created from terrestrial laser scanning surveys.

The last TLS survey was executed in October 2015 by means of Reigl VZ1000 interfaced by RiscanPro software, while previous observations belong to Optech ILRIS 3D acquisitions. Actually, data relative to May 2005, October 2006, June 2009 and 2011 are considered, each one composed of about 20 aligned point clouds provided by measuring from about 6 station points.

Digital surface models from different periods will be compared in order to evaluate possible volume changes due to landslides and rockfalls. In order to support our estimates, we also acquired GNSS data. For both data after a procedure of alignment of scans in a local reference, they have been georeferenced in UTM-WGS84 reference system.

The present study indicates that the method used can be useful to detect geomorphological evolution of Vesuvius crater. Therefore, in the future we have planned other scans surveys with aim to monitor the evolution of the Vesuvius crater.