Geophysical Research Abstracts
Vol. 16, EGU2014-6427, 2014
EGU General Assembly 2014

Cost effective aero-photogrammetry toys at active volcanoes: On the use of drones, balloons and kites

Thomas R. Walter
GFZ Potsdam, 2.1, Potsdam, Germany (twalter@gfz-potsdam.de)

The availability of aerial photographs allows spatial mapping of flows and fractures, generation of digital elevation models and other change detection. Therefore aerial photographs significantly improve our understanding of volcanic processes. The common problem is the lack of available data for most volcanoes, and the lack of systematic and chronologic repeat surveys. This work summarizes the current state of knowledge and technical implementations that currently revolutionize the field of aero-photogrammetry. By the use of unmanned vehicles, such as octocopters, helicopters and small airplanes, photo data can be acquired from almost any place at distances up to kilometres from the operator. Moreover, by the use of helium balloons, kites or their hybrid helikites, near field aero-photographs are obtained. In combination with modern stitching procedures and computer vision algorithms, the positioning of the camera and the digital elevation model of the ground can be extracted, and the active volcano and its eruption cloud be imaged from almost any perspective. This field is increasingly gaining flexibility, as lightweight cameras are available from visible, infrared and other spectral bands. Here example data are provided from volcanoes that are difficult to access by regular airplanes, showing the strengths and the limits of these new aero-photogrammetry toys.