Geophysical Research Abstracts
Vol. 17, EGU2015-1101, 2015
EGU General Assembly 2015

Dynamics of the 2014 Holuhraun fissure eruption analysed by video monitoring system

Tanja Witt and Thomas R. Walter
GFZ Potsdam, 2.1, Potsdam, Germany (twitt@gfz-potsdam.de)

Events on the volcanic system within the axial volcanic zones are linked to plate movements. The spreading and subsequent rifting of the crust take place at the plate boundary and occurs in distinct rifting episodes. These rifting episodes are characterized by earthquakes and volcanic eruptions within the central volcano or along fissures. For the subsurface structure of a volcanic system and the behavior of the magma plumbing system during major rifting episodes two contrasting models exists, (i) vertical feeding by a deep magma source or (ii) lateral feeding through a shallow magma chamber under the central volcano. The ongoing 2014 Holuhraun eruption is providing a unique opportunity to rigorously test the feeding paths of an active fissure eruption.

Here we employ video images to analyse the height and velocity variation of the lava fountains at the Holuhraun eruption fissure. On the first day of the eruption we could set up in total five high resolution video cameras. With algorithms of photogrammetry and correlation analysis we interpret the behavior of the lava fountains. Results suggest a significal lateral propagation path of the dynamics of the active vents, and a lateral migration of the peaks and lows of distinct lava fountains. Although the correlation system can change episodically and sporadically, both the frequency of the lava fountains and the eruption and rest time between single fountains remain similar for adjacent lava fountains imply a controlling process in the magma feeder system itself. We interpret the results by a lateral magma and gas flow underlying and feeding the eruption fissure. Systematic recording and analysis of video data hence help to decide which magma plumbing system is more reliable. Additionally, the dataset allows us to compare the eruption behavior to seismic datasets.