



Monitoring an eruption fissure in 3D: video recording, particle image velocimetry and dynamics

Tanja Witt and Thomas R. Walter

GFZ German Research Centre for Geosciences, Germany (twitt@gfz-potsdam.de)

The processes during an eruption are very complex. To get a better understanding several parameters are measured. One of the measured parameters is the velocity of particles and patterns, as ash and emitted magma, and of the volcano itself. The resulting velocity field provides insights into the dynamics of a vent.

Here we test our algorithm for 3 dimensional velocity fields on videos of the second fissure eruption of Bárðarbunga 2014. There we acquired videos from lava fountains of the main fissure with 2 high speed cameras with small angles between the cameras. Additionally we test the algorithm on videos from the geyser Strokkur, where we had 3 cameras and larger angles between the cameras. The velocity is calculated by a correlation in the Fourier space of contiguous images. Considering that we only have the velocity field of the surface smaller angles result in a better resolution of the existing velocity field in the near field. For general movements also larger angles can be useful, e.g. to get the direction, height and velocity of eruption clouds. In summary, it can be stated that 3D velocimetry can be used for several application and with different setup due to the application.