Grímsvötn eruption 21 – 28 May 2011

Steinunn S. Jakobsdóttir, Matthew J. Roberts, Gunnar B. Guðmundsson, Þórður Arason and IMO geophysical monitoring group.

Icelandic Meteorological Office, Bústaðavegur 9, 150 Reykjavík, Iceland

Grímsvötn is one of the most active volcanoes in Iceland, situated above the Iceland Hot Spot beneath Vatnajökull ice-cap. It has erupted about 60 times during the last eight centuries. A volcanic eruption started in Grímsvötn at approximately 1900h on 21 May 2011. The eruption was expected as the magma chamber inside the Grímsvötn caldera had inflated, giving approximately the same deformation as before the Grímsvötn eruption in 2004. There were even some speculations in October 2010 if an ongoing glacial flood, jökulhlaup, from Grímsvötn at that time would trigger an eruption, but that did not happen.

The onset of the eruption in 2011 was somewhat different from the one in 2004. Firstly, there was a decrease in seismicity the weeks before the eruption in 2011, while there was a considerable increase in seismicity before the one in 2004. Similarly, the 2011 eruption was preceded by only 80 minutes of intense seismicity.

Also the plume height during the first hours was much higher than in the 2004 eruption, reaching up to 20 kilometers intermittently. Very intensive lightning activity was observed during the first day. A large portion of the ash fell out from the lowermost ~5 kilometers of the plume and a considerable part spread out in about 10-12 kilometers height, while the uppermost part of the plume was light colored.

The eruption went on for seven days, the last explosions occurring around 0700h on 28 May.
The magma chamber is already inflating again, but as usual there are almost no earthquakes observed in Grímsvötn in the first months after the eruption.