



A new source of seismic events on Katla volcano's south flank

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Located beneath Myrdalsjokull ice cap, Katla volcano is one of the most active and threatening volcanoes in Iceland, with at least 20 eruptions in the last 1100 years. The last phreatomagmatic eruption to break the ice-surface occurred in 1918 and signs of unrest have been detected since 1955, culminating in flooding from the ice cap in 1955, 1999 and 2011. Since the first sensitive seismographs were installed in the 1960ies, persistent seismicity has been detected at Katla, occurring mainly in two source areas: the summit caldera and a region west of it. Since July 2011, though, this general pattern has shown changes. An increase in seismicity and a 24 hour tremor burst were recorded on 8-9th July, associated with flooding from the south east rim of Myrdalsjokull glacier and the formation and deepening of ice cauldrons. At the same time a new area on the southern rim of the glacier near Gvendarfell rise became seismically active. Some hypotheses were proposed that related these events to glacial or volcanic processes.

Following the eruption of the neighbouring Eyjafjallajokull volcano in 2010, the permanent seismic network of the Icelandic Meteorological Office was extended to 10 stations and augmented with 9 temporary stations installed by Uppsala University at the caldera and around the glacier from May 2011 to August 2013. Data from permanent and temporary stations are being analysed to understand and characterize Katla seismic sources, in particular focusing on the new south-flank seismicity. Geological field investigations were also carried out in this area.

The Gvendarfell seismicity is shallow and characterized by long-period, nearly monochromatic, repeating earthquakes (one family of similar waveforms), occurring in an extremely regular time pattern.

A pilot study of the geology of the Gvendarfell area revealed the presence of several subvolcanic and subglacial rhyolitic bodies and signs of recent tectonic processes testified by a remarkable normal fault trending N-S, located west of Gvendarfell close to the epicentral area.

No definitive interpretations of the new seismicity are offered so far. However, these observations are consistent with a volcanic source such as magma injection in the south flank of Katla.