



## **Local lp-events study in a glaciated volcanic environment in south Iceland**

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For decades long-period (lp) events have been registered in the western part of the Katla volcano, covered by the glacier Mýrdalsjökull in south Iceland. The events are of unusually long duration and the coda is complex. Since the events originate in a volcanically active environment, scientist have sought an explanation of their unusual waveforms as either due to a volcanic source or path effects. We propose a different source of the lp-events in western Mýrdalsjökull: the motion of the ice. The western part of Mýrdalsjökull is very steep and the glacier produces long period seismic signals as it slides with a jerky stick-slip motion over the bed. The greatest magnitude signals are produced when large ice blocks slide over a high cliff. The complex coda consists of a repeating slow-slip signal coming from a single couple source which for the larger events is mixed with impact signals from the associated massive ice-fall. The extended source time function creates long-period signals of repeating weak p-waves, large s-waves and complex surface wave coda. Even though the source is repeating, the jerky nature of the process makes all waveform correlation analysis very difficult.

If our new hypothesis is correct then this clearly has major implications for the use of seismicity both for understanding the evolution of ice covered volcanoes and for monitoring them with the aim of disaster mitigation.