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# **Operational reliability of a system based on lightning data for early estimation of eruption site location**

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At the onset of an explosive eruption, the early determination of the exact eruption site may be critical to activate civil protection evacuation plans. Powerful subglacial volcanism is expected to produce volcanic lightning during its early hours. In April 2013, an automatic real-time system was installed at the Icelandic Meteorological Office, that monitors and analyses lightning to locate the eruption site. This system is based on lightning data from the ATDnet long range system of the UK Met Office. During these first five years of operation, the system has never been tested by an explosive eruption, as none has occurred. A dormant automatic monitoring system waiting for a rare event is quite susceptible to degeneration during the waiting period, and IT-system upgrades pose a serious threat. However, ordinary weather thunderstorms in Iceland are used to monitor the status of the system. At high latitudes, thunderstorms are rare and during these first years of operation, the system was automatically activated on average once per week. The time from the first observed lightning strike of a thunderstorm until the system had finished analysing the data and sent an E-mail warning was usually 7-18 minutes (90% of warnings). In late 2017 this system went through a major IT-systems upgrade, where programs needed to be recompiled and moved to a new computer. Furthermore, the responsibility for the operation of the system was changed. As expected this change had noticeable effect on its reliability. This study reviews the use of the lightning detection system as an important monitoring tool for an early detection of eruption source location, and its long term sensitivity to computer upgrades.