

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)
General Assembly
18-22 August 2008
Reykjavík, Iceland

Volcanogenic Lightning

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Lightning activity is common in volcanic ash plumes, especially in subglacial or submarine eruptions. The interaction between magma and water is considered responsible for electric charge separation, leading to positively charged vapor and negatively charged ash. Lightning data collected during the last three volcanic eruptions in Iceland; Grímsvötn 1998, Hekla 2000 and Grímsvötn 2004, are reviewed. The lightning in the Grímsvötn 1998 subglacial eruption were measured by both the LLP Icelandic lightning location system and the ATD sferics system of the UK Met Office. During the eruptions of Hekla 2000 and Grímsvötn 2004 we collected data from both these lightning location systems as well as from our EFMS wave recording station, located in Reykjavík. We note a good correlation between the lightning activity and the intensity of the eruptions as indicated by the height of the ash plume observed by weather radar. The lightning data collected during these three brief volcanic eruptions gives valuable insight into the character of volcanogenic lightning and how they differ from weather lightning.