Þórður Arason (2016), Earth, water, wind and fire: On the charge generation of volcanic lightning, Erindi, USGS Cascades Volcano Observatory, Vancouver, Washington, USA, 7. desember 2016

Earth, Water, Wind and Fire: On the Charge Generation of Volcanic Lightning

Þórður Arason, Icelandic Meteorological Office, Reykjavík, Iceland

A few different processes that have been proposed as the cause for electric charge generation in volcanic plumes will be discussed. Observations during the Eyjafjallajökull 2010 eruption in Iceland suggest that the charge generation for large whole-plume thunderbolts may have been analogous to the one in meteorological thunderstorms, where hail plays a significant role in both the generation and separation of charges within the cloud. At the top of plumes where ambient temperatures may reach –20˚ to –50˚C, fine ash particles may provide ample nuclei for condensation and ice growth. The occurrence and properties of hail in preserved deposits will be shown for the Eyjafjallajökull 2010 and Grímsvötn 2011 eruptions. In addition to charge generation, ash-infused hail may supply a vessel for fine grained ash to be scrubbed prematurely from plumes and deposited close to the volcano.