

Dirty thunderstorm

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A **dirty thunderstorm** (also **volcanic lightning**) is a weather phenomenon that is related to the production of lightning in a volcanic plume.^[1]

A famous image of the phenomenon was photographed by Carlos Gutierrez and occurred in Chile above the Chaiten Volcano.^[2] It circulated widely on the internet.

Other instances have been reported above Alaska's Mount Augustine volcano,^[3] Iceland's Eyjafjallajökull volcano^[4] and Mount Etna in Sicily, Italy.^[5]



Volcanic lightning above an eruption of Mount Rinjani.

Causes

A study in the journal *Science* indicated that electrical charges are generated when rock fragments, ash, and ice particles in a volcanic plume collide and produce static charges, just as ice particles collide in regular thunderstorms.^[6]

Volcanic eruptions are sometimes accompanied by flashes of lightning. However, this lightning doesn't descend from storm clouds in the sky. It is generated within the ash cloud spewing from the volcano, in a process called charge separation.

As the plume started going downwind, it seemed to have a life of its own and produced some 300 more or less normal [lightning bolts] ... The implication is that it has produced more charge than it started with. Otherwise [the plume] couldn't continue to make lightning.

—Martin A. Uman, co-director of the University of Florida Lightning Research program

Volcanic eruptions also release large amounts of water, which may help fuel these thunderstorms.

References

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