

Researchers suggest earthquake lightning may be due to cracks forming in Earth's surface

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Credit: Jim Conacher

(Phys.org) —A team of four researchers from several universities in the U.S. has given a presentation at this year's American Physical Society meeting, outlining a theory they are developing to help explain a

phenomenon known as earthquake lightning.

People have been telling tales of seeing [lightning](#) in a cloudless sky just prior to (and sometimes during) earthquakes for several hundred years, though many have ascribed such tales to drinking or hysterics. More recently, however, some have proven it exists by capturing it on video. In this new effort the research team has reported that they may have found its source. Moving material creates [voltage](#), they report, when cracks form. As an example, they found that filling a plastic tub with flour and tilting it back and forth till cracks develop, results in a spike in voltage. Though they are at a loss when trying to explain how or why it happens, they report also that it is very easily repeatable and can happen with many other types of materials as well. They suggest the same sort of thing happens with earthquakes around [fault lines](#). The material in the ground is moved back and forth until eventually a crack develops. When that happens, a surge of voltage is unleashed into the atmosphere, creating what observers describe as lightning.

What's perhaps most strange, or interesting about the phenomenon, is that there is no known explanation for it. It doesn't appear to be simple friction, as it occurs with other materials when they separate rather than rub, such as with Scotch tape as it is unreeled, or with Mint Life Savers when they're broken.

The team plans to continue experimenting with various materials, hoping to eventually find an explanation for how such voltage spikes occur, which might help explain why earthquakes don't always generate lightning or why clear sky lightning isn't always followed by an earthquake. Figuring it out, they add, could perhaps lead to a new kind of [earthquake prediction](#) system (by measuring voltage spikes in the atmosphere) or in developing other applications such as [fault detection](#) in ceramics to predict impending problems such as a turbine blade about to shatter.

More information: Abstract: S17.00007 : Unexplained voltage signals from granular materials:

meetings.aps.org/Meeting/MAR14/Event/214444

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