

Scientists locate parent lightning strokes of sprites

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Bright red sprite with multiple elements observed over an MCS on the Great Plains of the United States. Credit: Gaopeng Lu

Thunderstorms can generate various forms of transient luminous events, such as red sprites, gigantic jets, and blue jets through the charge

transfer involved in the lightning forged inside thunderclouds.

Using the Lightning Effects Research Platform (LERP), a research team from the Institute of Atmospheric Physics of the Chinese Academy of Sciences reported the location results for the parent [lightning strokes](#) of more than 30 [red sprites](#) observed over an asymmetric mesoscale convective system (MCS) on July 30, 2015 in Shandong Province, China, with a long-baseline lightning location network of very-low-frequency/low-frequency magnetic field sensors.

"This is probably the most productive sprite-producing thunderstorm system ever reported in China," says Dr. Lu Gaopeng, the corresponding author of the study.

The results showed that almost all of these cloud-to-ground (CG) strokes were produced during the mature stage of the MCS, and were predominantly located in the trailing stratiform region.

This finding was similar to analyses of typical sprite-productive MCSs in North America and Europe. Comparison between the location results for the sprite-producing CG strokes and those provided by the World Wide Lightning Location Network (WWLLN) indicated that the location accuracy of the WWLLN for intense CG strokes in Shandong Province was typically within 10 km.

This result was generally consistent with the result based on analysis of more than 2000 sprite-producing CG strokes in the continental United States. Also, the authors analyzed two cases where some minor [lightning](#) discharges in the parent flash of sprites could also be located, providing an approach to confine the thundercloud region tapped by the [sprite](#)-producing CG strokes.

More information: Anjing Huang et al, Locating Parent Lightning

Strokes of Sprites Observed over a Mesoscale Convective System in Shandong Province, China, *Advances in Atmospheric Sciences* (2018).
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