

Upper atmospheric lightning sprites caught in 3D video

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Image credit: NHK / AGU

(PhysOrg.com) -- Sometimes in science, it's easy to get caught up in the practical, to focus so heavily on the why's and how's of things, that it's easy to miss the simple beauty that nature offers. That might be the case with a little known type of lightening that occurs between the part of the atmosphere where weather events are seen quite easily, and the far reaches near the beginning of space. Called sprites, these other kinds of lightening strikes are of far shorter duration than we're accustomed to; it wasn't until just the past thirty years or so that anyone even knew they existed. So odd were they, that pilots flying at high altitudes who saw

them feared for their jobs if they spoke of them. Now however a research team has captured some instances of them using high speed cameras mounted on two jets to create 3D images.

In some respects, the images produced by the research team look like fireworks, creating jellyfish type patterns far above the thunderstorms below that are thought to spawn them. In others, they appear almost liquid in their fluidity. And even though they are way up there, some fifty miles from the ground, they can still be seen, as they are frequently brighter than Venus in the night sky, though doubtless most who have seen them, didn't know they did, as they would have existed among regular storm cloud activity. Sort of like sprites and elves of lore.

Scientists still don't know much about them, though theories regarding their origin abound. One that seems plausible is that when lightening with a positive charge occurs, surrounding clouds are drained of a positive charge, leaving them with a net negative charge, which could lead to an electrical field building up between the clouds and the upper atmosphere; when it reaches a certain point, sprites and elves appear. What's also unclear is whether sprites and elves have any impact on weather, or if they just exist for moment, then disappear; ghostly bright apparitions one moment, gone the next without a trace.

In the language of those studying the phenomenon, sprites are the part of the lightening that resemble jellyfish and travel downwards after starting out as a ball shape. Elves are the halos that create the eerie effects. Both are reddish in color and last for something like 10 milliseconds.

The video was captured by a research team funded by the Japanese Broadcasting Corporation. Two jets flying over parts of the south-west United States this past summer, with cameras aboard, were used for filming to create the 3D effect and the results were presented at the American Geophysical Union Conference last week.

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