

Mystery of Purple Lights in Sky Solved With Help From Citizen Scientists



*STEVE (Strong Thermal Emission Velocity Enhancement) is seen as a thin purple ribbon of light.
Photo Credit: ©Megan Hoffman*

Glowing in mostly purple and green colors, a newly discovered celestial phenomenon, Strong Thermal Emission Velocity Enhancement (STEVE) is sparking the interest of scientists, photographers and astronauts.

The Aurorasaurus team, supported by the National Science Foundation and NASA, worked with citizen scientists and a group of amateur photographers in Canada to identify STEVE. In July of 2016, one of these photographers snapped a photo of STEVE – at the same time, the European Space Agency’s Swarm Satellite documented the STEVE event from space.

With both the ground and satellite views of STEVE, findings published in Science Advances showed that STEVE comprises a sub auroral ion drift (SAID), with extremely hot particles that travel along different magnetic field lines than the aurora. Consequently, STEVE appears in the sub auroral zone, an area of lower latitude than where most auroras appear, an area that is not well researched.

Capturing observations of STEVE is a game of perseverance and probability -- if the satellite misses STEVE, the phenomena will likely be gone by the time the satellite crosses that spot again.

However, citizen scientists observing STEVE offer a new way to probe these processes in the sub-auroral zone. That fact that STEVE appears in the presence of auroras also suggests that something happens in in near-Earth space to cause both an aurora and STEVE. This dual set of light emissions provides a visual aid to show a plasma physical connection between the high latitude auroral zone and lower latitude sub auroral zone.

For more information: <https://www.nasa.gov/feature/goddard/2018/mystery-of-purple-lights-in-sky-solved-with-help-from-citizen-scientists>