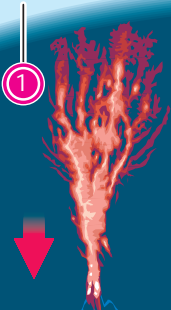


Sky-high lightning jets complete the circuit

Newly-discovered “giant optical jets” – intense high-altitude lightning shooting 90km from the tops of clouds into the atmosphere – may be helping to balance the global electrical circuit between Earth and the edge of space. The jets are also thought to play a role in ozone formation

Red sprite: 40-50km long, travelling down from ionosphere. Duration: Under 10 milliseconds



Blue jet: 40km cone from top of cloud. Duration: 200-300ms



Gigantic optical jet: Stream of negative charge to ionosphere from top of cloud above ocean thunderstorm



IONOSPHERE
Altitude 95km
Positively charged “shell” around atmosphere

Elves: Flash in ionosphere, 500km in diameter, Duration: 1ms

THUNDER CLOUD
Altitude 16km

Build-up of charged particles released as lightning

Sheet: Intracloud lightning obscured behind clouds

Fork: Cloud-to-ground (or vice versa) electron stream

Ball: Size between tennis ball and beach ball. Composed of burning silicon filaments or plasma created when lightning strikes ground



Potential difference 300,000 volts



EARTH: Negatively charged surface