

NASA sounding rockets to study Earth's magnetic field

26/11/2015 17:26 by admin

Washington: NASA is launching two sounding rockets over Norway to study how particles move in a region near the North Pole where the Earth's magnetic field is directly connected to the solar wind.

After the launch window opens on November 27, the CAPER and RENU 2 rockets will have to wait for low winds and a daytime aurora before they can send their instrument payloads soaring through the Northern Lights.

Both instrument packages are studying phenomena related to the cusp aurora, a particular subset of the Northern Lights in which energetic particles are accelerated downward into the atmosphere directly from the solar wind - that is, the constant outward flow of solar material from the sun.

Though cusp auroras are not particularly rare, they are often difficult to spot because they only happen during the day, when sunlight usually drowns out what would otherwise be a spectacular light show.

"The magnetic pole is tilted towards North America, putting this magnetic opening-the cusp-at a higher latitude on the European side," said Jim LaBelle, principal investigator on the CAPER sounding rocket at Dartmouth College in New Hampshire.

"Combine that extra-high latitude with the winter solstice-when nights are longest, especially as you go farther north-and you can sometimes see this daytime aurora with the naked eye," he added.

The two sounding rocket teams will also employ data from ground-based radars to detect the cusp aurora even in the case of clouds.

CAPER, short for Cusp Alfvén and Plasma Electrodynamics Rocket, will be first in the queue to launch.

CAPER is investigating the electromagnetic, or EM, waves that can accelerate electrons down into Earth's atmosphere or up out to space.

The other sounding rocket to launch, RENU 2, will study the relationship between the inflow of electrons that creates the cusp aurora, electric currents flowing along magnetic field lines, and dense columns of heated neutral atoms in the upper atmosphere.

Though CAPER and RENU 2 will collect data for only a few minutes each, suborbital sounding rockets are a valuable way to study space and the upper atmosphere at relatively low cost.

- PTI