

NASA's MMS breaks Guinness World Record

November 4 2016

NASA's Magnetospheric Multiscale mission, or MMS, is breaking records. MMS now holds the Guinness World Record for highest altitude fix of a GPS signal. Operating in a highly elliptical orbit around Earth, the MMS satellites set the record at 43,500 miles above the surface. The four MMS spacecraft incorporate GPS measurements into their precise tracking systems, which require extremely sensitive position and orbit calculations to guide tight flying formations.

Earlier this year, MMS achieved the closest flying separation of a multi-spacecraft formation with only four-and-a-half miles between the four satellites. When the satellites are closest to Earth, they move at up to 22,000 miles per hour, making them the fastest known operational use of a GPS receiver.

When MMS is not breaking records, it conducts ground-breaking science. Still in the first year of its prime mission, MMS is giving scientists new insight into Earth's magnetosphere. The mission uses four individual satellites that fly in a pyramid formation to map magnetic reconnection - a process that occurs as the sun and Earth's magnetic fields interact. Precise GPS tracking allows the satellites to maintain a tight formation and obtain high resolution three-dimensional observations.

Understanding the causes of [magnetic reconnection](#) is important for understanding phenomena around the universe from auroras on Earth, to flares on the surface of the sun, and even to areas surrounding black

holes.

Next spring, MMS will enter Phase 2 of the mission and the satellites will be sent in to an even larger orbit where they will explore a different part of Earth's magnetosphere. During that time, the satellites are anticipated to break their current high altitude GPS record by a factor of two or more.

Provided by NASA's Goddard Space Flight Center

Citation: NASA's MMS breaks Guinness World Record (2016, November 4) retrieved 27 April 2024 from <https://phys.org/news/2016-11-nasa-mms-guinness-world.html>

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