

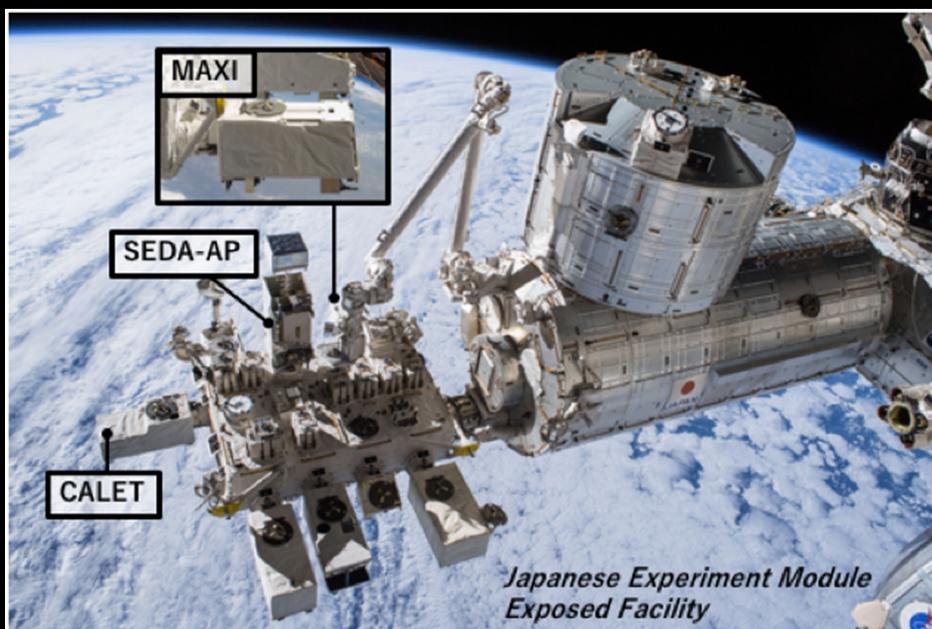


Do relativistic electrons produce dangerous levels of radiation for space walkers?



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The astronauts conducting extravehicular activities outside the International Space Station (ISS) have been exposed to a sporadic radiation dose due to so-called relativistic electron precipitation (REP) events. The scientists set out to answer: What is the dose rate of such events at the ISS and does that rate pose a significant danger to the health of astronauts?



Locations of CALET, MAXI, and SEDA-AP on the exposure module of ISS.

REP events are a fundamental process where electrons leave Earth's outer radiation belt. As these electrons precipitate into the atmosphere, they can collide with the ISS and other spacecraft. The scientists provided a quantitative estimate of the radiation dose during REP events at the ISS.

They used data collected by the CALorimetric Electron Telescope (CALET), the Monitor of All-sky X-ray Image (MAXI), and the Space Environment Data Acquisition equipment-Attached Payload (SEDA-AP). The three ISS detectors offer complementary REP observations, including energy spectra and flux directional information, during a period of approximately 2.5 years, from November 2015 to March 2018. They anticipate that the list of REP events provided in this paper will help to form future collaborative studies.

During the 2.5-year period, 762 REPs were detected. The scientists determined that of those, there were 34 relatively strong REP events exceeding 1 mSv per event. The largest REP event was 3 mSv per event. **Such low values will not affect the astronauts' health.**