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NANOSWAI: A NANOSATELLITE FOR ASTROPARTICLE PARTICLE PHYSICS WITH ONBOARD AI AIDED CONTROL

Abstract

We will present a 3D nanosatellite, currently under development for estimated launch in 2024 at LEO, which will have the capability of magnetospherically trapped electrons and of high energy gamma photons from astrophysical sources. The satellite has a 3U CubeSat format with deployable solar panels and antennas, and will have as main payload a particle detector based on a Silicon Photo Multiplier detector coupled to two plastic scintillators working in coincidence. The detector has been developed at LINX and is based on previous experience gained from the development of several pathfinders of the proposed Extreme University Space Observatory, JEM-EUSO, for ultra-high energy cosmic ray detection. To solve the practical problem of operation from a single ground station and short time fly-bye, the satellite will incorporate onboard AI to efficiently administer its actual resources in real time, maximizing data download and improving performance in general by optimizing scientific task scheduling. The main subsystems, science payload and operation philosophy will be described.