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Update on the Terzina payload development onboard NUSES

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Understanding the universe at the highest energies requires innovative approaches, as the fluxes of CRs at these energies are exceedingly low due to the power-law nature of the CR spectra. Current state-of-the-art experiments, such as the Pierre Auger Observatory and Telescope Array (TA) ground-based detectors for CR physics and IceCube and KM3Net for neutrino observations, have already instrumented areas on the order of thousands of km^2 and volumes of about 1 km^3 (respectively). However, expanding these footprints further, with the objective of increasing instrumental acceptances, soon becomes unsustainable and prohibitively expensive. A promising strategy to extend the reach of UHE CR and neutrino measurements is to move the observations to space, where a single satellite in orbit can provide access to large mass targets.

Terzina, in fact, is a compact telescope that will serve as a technological pathfinder for the indirect space-based measurements of CRs and neutrinos. Terzina will operate at a sun-synchronous orbit to study two-types of events: above-the-limb events corresponding to UHE CRs and below-the-limb events associated with earth-skimming neutrinos –high-energy astrophysical neutrinos interacting with the Earth, converting into leptons which successively induce upward-moving showers in atmosphere. Using Schmidt-Cassegrain optics, the telescope will focus the Cherenkov emissions produced by secondary particles in EAS onto an innovative focal plane consisting of 640 SiPMs (10 arrays of 8x8 cells), generating a photon hit-map output of the shower.

This presentation will provide an overview of the Terzina payload onboard the NUSES mission and will deliver an update on the current status of the payload including its instrumental development, assembly, qualifications, and simulation framework.

Eligibility for ”Best presentation for young researcher” or ”Best poster for young researcher” prize

Yes

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