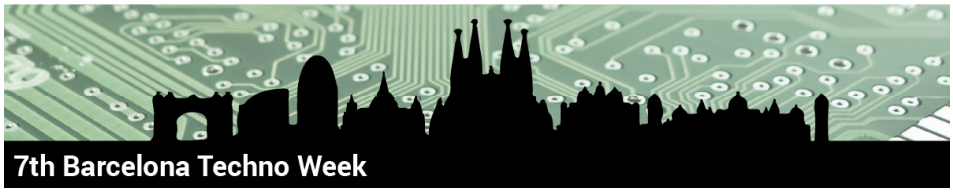

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Terzina on-board of the NUSES satellite: a pathfinder for EAS Cherenkov light detection from space

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Ultra High Energy Cosmic Rays (UHECRs) above 100 PeV could be detected from space by pointing to the Earth's limb when the optical emission from extensive air showers (EAS) is produced. A space-born experiment could also play a key role in the multi-messenger field if the detection of Earth-skimming neutrinos will be ensured. The validation process for this detection of rare UHE events goes through precursors such as the NUSES space mission, designed to be operated in a Sunsynchronous, quasi-polar, low Earth orbit. On board the satellite platform, developed by TAS-I, two payloads will be equipped: Terzina, mainly discussed in this contribution, and ZIRE', devoted to low energy cosmic and gamma rays, space weather, and magnetosphere-ionosphere-lithosphere coupling. The Terzina telescope aims to detect UHECRs through the Cherenkov light emission from EAS that they create in the Earth's atmosphere. The Cherenkov photons are aligned along the shower axis inside about ~ $0.2 - 1^{\circ}$. In this contribution, we focus on describing the telescope detection goals, geometry, optical and electronics design and its photon detection camera composed of Silicon Photo-Multipliers. Moreover, we describe the full Monte Carlo simulation developed to estimate Terzina's performance for UHECR detection. Terzina will be able to study the potential for future physics missions (e.g. POEMMA) devoted to UHECR detection and to UHE neutrino astronomy.

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