

# Ultra high energy photons and neutrinos with JEM-EUSO

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**Abstract** Ultra high energy photons and neutrinos are carriers of very important astrophysical information. They may be produced at the sites of cosmic ray acceleration or during the propagation of the cosmic rays in the intergalactic medium. In contrast to charged cosmic rays, photon and neutrino arrival directions point to the production site because they are not deflected by the magnetic fields of the Galaxy or the intergalactic medium. In this work we study the characteristics of the longitudinal development of showers initiated by photons and neutrinos at the highest energies. These studies are relevant for development of techniques for neutrino and photon identification by the JEM-EUSO telescope. In particular, we study the possibility of observing the multi-peak structure of very deep horizontal neutrino showers with JEM-EUSO. We also discuss the possibility to determine the flavor content of the incident neutrino flux by taking advantage of the different characteristics of the longitudinal profiles generated by different type of neutrinos. This is of great importance for the study of the fundamental properties of neutrinos at the highest energies. Regarding photons, we discuss the detectability of the cosmogenic component by JEM-EUSO and also estimate the expected upper limits on the photon fraction which

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