

Study of Atmospheric Cascades Generated by Primary Cosmic Rays, from Simulations in Corsika for the City of Tunja in Colombia

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Abstract : The study of cosmic rays is based on two fundamental pillars: the detection of secondary cosmic rays on the Earth's surface and the detection of the source and origin of the cascade. In addition, the constant flow of RC generates a lot of interest for study due to the incidence of various natural phenomena, which makes it relevant to characterize their incidence parameters to determine their effect not only at subsoil or terrestrial surface levels but also throughout the atmosphere. To determine the physical parameters of the primary cosmic ray, the implementation of robust algorithms capable of reconstructing the cascade from the measured values is required, with a high level of reliability. Therefore, it is proposed to build a machine learning system that will be fed from the cosmic ray simulations in CORSIKA at different energies that lie in a range $[10^9-10^{12}]$ eV. in order to generate a trained particle and pattern recognition system to obtain greater efficiency when inferring the nature of the origin of the cascade for EAS in the atmosphere considering atmospheric models.

Keywords : CORSIKA, cosmic rays, eas, Colombia

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