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DEASA array: A simulation study of the secondary particles in air shower using CORSIKA code

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A mini array called DEASA (Dayalbagh Educational Air Shower Array) has been set up in Nuclear Electronics Laboratory, Dayalbagh Educational Institute Agra. This is the first detector array in Northern India (Uttar Pradesh) to study the cosmic rays. This array is 168 m above sea level with a latitude of 27.22° N and a longitude of 78° E. DEASA has been set up and started working at the Dayalbagh educational institute, Agra in 2021 to study the showers. This array is consisting of 8 plastic scintillation detectors each of area 1 m² and 2 cm thick. These detectors are kept at a distance of 8 m from each other and this array covers an area of 260 m². In this work, air showers have been simulated by CORSIKA code at Agra specifications with iron, proton, and alpha as the primary particles. The longitudinal profile of the showers at different atmospheric depths is studied. The main study of CORSIKA is the high energy electromagnetic and hadronic interactions which are still untouched by our accelerators. Thus the Monte Carlo simulation code provides hadronic interaction models at higher energies. EPOS model along with QGSJET and later DPMJET models have been selected for the studies. The lateral profile of the showers are also plotted.

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