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Cosmic rays primary energy estimation using Machine Learning and combined reconstruction

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The IceCube Neutrino Observatory at the South Pole is capable of measuring two components of the cosmic rays air shower. The electromagnetic component using a km2 surface array IceTop, and the high-energy muonic component using km3 in-ice array IceCube between 1.5 and 2.5 km below the surface. The combination of both arrays in conjunction with a new flexible curvature and new timing fluctuation function provides an opportunity for possible improvements of cosmic rays reconstruction. This work presents a preliminary investigation of possible improvements of cosmic rays primary energy estimation (proton, iron, helium, and oxygen) by using Machine Learning techniques and combined reconstruction.

Type of Contribution

talk

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