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Composition study of cosmic rays using machine-learning at the IceCube Neutrino Observatory MATTHIAS PLUM, KAREN ANDEEN, Marquette Univ, ICECUBE COLLABORATION — The IceCube Neutrino Observatory at the South Pole is a multi-component detector capable of measuring cosmic rays in the energy range from PeV to EeV. This energy region is typically thought to cover the transition from galactic to extragalactic sources. The IceTop array at the surface is sensitive to the electromagnetic part of an air shower while the deep in-ice array detects the high-energy (TeV) muonic component. By applying modern machine-learning and statistical methods to reconstructed cosmic-ray air showers passing through both arrays, the primary energy and the composition can be simultaneously measured. In this contribution, we will discuss the reconstruction technique and composition sensitivity of IceCube observables presently under development for future detector enhancements of IceCube Observatory.

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