Separation of Cosmic-Ray Electrons from Protons Using the ISS-CREAM Instrument[1] SINCHUL KANG, Kyungpook Natl Univ, ISS-CREAM COLLABORATION — The Cosmic Ray Energetics And Mass for the International Space Station (ISS-CREAM) experiment is designed to study high-energy cosmic rays on the ISS. The ISS-CREAM instrument was launched on 14th of August 2017 aboard the SpaceX-12 Dragon spacecraft. The silicon charge detector provides measurement of cosmic-ray charges with resolutions of 0.1-0.3 e. The calorimeter (CAL) provides measurement of the incident cosmic-ray energies using shower energy deposited. The Top and Bottom Counting Detectors (TCD/BCD) are used to separate electrons from protons using the different shower shapes between hadronic and electromagnetic showers. Since the TCD/BCD, two arrays of 20×20 photodiodes on a plastic scintillator, are placed above and below the CAL., the TCD/BCD can measure the longitudinal and lateral profiles of the showers. In this study, a machine learning technique is used with TCD/BCD for the separation of electrons from protons. Protons with a power-law $E^{-2.7}$ and electrons with energies from 300 GeV to 10 TeV, generated from Geant3 Monte Carlo (MC) simulations, are used for training data. The MC data were smeared with noise from pedestal data to represent the instrument effects. We will present preliminary results on the study of cosmic-ray electron-proton separations.

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