Contribution ID: **334** Type: **Poster**

ROESTI: A Front-end Electronics for Straw Tube Tracker in COMET Experiment

The COMET experiment at J-PARC aims to search for the charged lepton flavor violating process of neutrinoless μ-e conversion with an improvement of a sensitivity by a factor of 10000 to the current limit. When the μ-e conversion occurs, almost all the energy of the muon mass is carried out by the electron which is expected to have the monochromatic energy of about 105 MeV. In order to achieve the goal sensitivity, the measurement of the electron with momentum resolution of better than 200 keV/c is needed. We plan to use a straw tube tracker as an electron detector, which can reduce multiple scattering effect strongly. To read out the signal from the tracker precisely, an optimal front-end electronics is also needed, and we have developed the readout electronics board called ROESTI. The ROESTI requires gain of about 1 V/pC due to the minimum charge from the tracker, timing resolution of ns order due to the position resolution and the drift velocity of the tracker, and pileup capability due to the hit rate of 100 kHz for 5×10^9 μ/s. We should also consider the number of readout channels, power consumption, and space limitation. Based on these requirements, we have designed ROESTI which contains all the front-end processes; preamplification, pulse-shaping, discrimination, and digitization, and all function is controlled through a local bus by a FPGA-based readout controller. We have developed the ROESTI prototype and evaluated the performance. In this presentation, we report the current status of the ROESTI prototype.

Author: Dr UENO, Kazuki (KEK)

Co-authors: Dr NISHIGUCHI, Hajime (KEK); Mr OKAMOTO, Keita (Osaka University); Prof. TANAKA, Manobu (KEK); Dr IKENO, Masahiro (KEK); Prof. MIHARA, Satoshi (KEK); Mr HAYASHI, Tatsuya (Osaka University); Dr UCHIDA, Tomohisa (KEK)

Presenter: Dr UENO, Kazuki (KEK)

Track Classification: Data-processing: 3a) Front-end Electronics