# Performance Evaluation of readout electronics board for the COMET Straw Tube Tracker

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The COMET experiment searches for the charged lepton flavor violation in conversion from muon to electron (μ-e conversion) through coherent process [1]. We report the results of performance evaluation of the front-end readout electronics board named "ROESTI" for the COMET Straw Tube Tracker. The ROESTI performs preamplification, pulse-shaping, discrimination and digitization. All the processes are controlled by FPGA. To achieve a factor of $10^4$ the better sensitivity than current limit of the μ-e conversion search, we require high momentum resolution for the straw tube tracker less than 200 keV/c at 105 MeV/c in high rate and high pile-up environment. We design the ROESTI to sample waveforms. Consequently, the waveforms coming from pile-up events can be separated into each waveform.


Figure. 1
Photo of the ROESTI readout electronics board.

We evaluated the performance of the ROESTI in terms of noise level, gain, linearity, timing resolution and connection speed. In addition we plan to produce the next version of the ROESTI, aiming to install the board into the COMET experiment. We will report the detail of results of evaluations and prospects of production of the next version in the symposium.

References

[1] Y. Kuno for the collaboration, "A search for muon-to-electron conversion at J-PARC : The COMET experiment", Prog. Theor. Exp. Phys. **2013**, 022C01