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Performance evaluation of new parallel VME readout system for unstable nuclear physics

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The RIBF DAQ system is used for researches of unstable nuclear physics at RI Beam Factory in RIKEN [H.Baba et al., Nucl.Instr.Meth.A 616, 65 (2010)]. This system can take the data of CAMAC and VME standard modules such as QDC, TDC, ADC from front-end-computers. Recently, the new MOCO (mountable controller) and the MPV (MOCO with parallelized VME) system have been developed [H.Baba et al., RIKEN Acc.Prog.Rep. 52, 146, (2019) and poster presentation in this conf.]. As a result, the data from the several VME modules can be read out in parallel at high speed. On the other hand, some experiments such as measurements of the total reaction cross sections require very low error rates of the data in the order of less than 0.01%.
Therefore, we verified the accuracy of the data in an actual accelerator experiment. The QDC, TDC, and ADC data of radiation detectors were acquired by using well confirmed CAMAC standard modules and the unconfirmed VME standard modules with the MPV+MOCO system redundantly and simultaneously.
We evaluated the accuracy of the data of the system in the order of 0.01% by comparing the VME data with the CAMAC data. By using this new VME-based DAQ system with MPV+MOCO, the dead time can be reduced from about 150 us to about 15 us in typical set ups of the experiments, we can take the data with the high trigger rates efficiently. In this presentation, we will report these results.

Minioral

Yes

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No

Are you a student?

Yes

Author: TAKAHASHI, Hiroyuki (Tokyo City University)

Co-authors: Prof. NISHIMURA, D. (Tokyo City University); Prof. BABA, H. (RIKEN Nishina Center); Prof. FUKUDA, M. (Osaka University); Mr SUGAWARA, S. (Tokyo City University); Dr TANAKA, M. (Kyushyu University); Mr FUKUDA, S. (National Institutes for Quantum and Radiological Science and Technology); Ms FUKUTOME, M. (Osaka University); Mr HARAYAMA, S. (Saitama Univesity); Prof. IZUMIKAWA, T. (RI Center Niigata University); Mr KITAGAWA, A. (National Institutes for Quantum and Radiological Science and Technology); Ms KIMURA, Y. (Osaka University); Prof. MIHARA, M. (Osaka University); Prof. MORIGUCHI, T. (Tsukuba University); Mr NOGUCHI, N. (Niigata University); Mr OGOSE, M. (Niigata University); Prof. OHTUBO, T. (Niigata University); Ms OTANI, Y. (Osaka University); Mr SAKAI, T. (Osaka University); Mr SATO, S. (National Institutes for Quantum and Radiological Science and Technology); Prof. SUZUKI, T. (Saitama Univesity); Mr TAKAYAMA, G. (Osaka University); Mr TOKUDA, M. (Osaka University); Prof. YAMAGUCHI, T. (Saitama Univesity)

Presenter: TAKAHASHI, Hiroyuki (Tokyo City University)

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