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High Speed Data Receiver Card for Future Upgrade of Belle II DAQ

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We present performance study of a high-speed RocketIO receiver card implemented as PCI-express device intended for the use in future luminosity-frontier HEP experiment.

To search for a new physics beyond the Standard Model, we start Belle II experiment from 2015 in KEK, Japan. In Belle II, the detector signals are digitized in or nearby the detector complex, and the digitized signals are transmitted to VME-9U sized data receiving boards located about 10m away from the detector over RocketIO optical links. The data receiving board is responsible to provide pipeline, online data processor, and Ethernet outlet connected to external event building PC. For a possible future upgrade of the data receiving board, we design a RocketIO receiver card to be attached to a PC as a PCI-express device.

In addition to above, the device is a backup solution for a data receiver from DEPFET pixel detectors of Belle II. In the backup solution, we plan to process the pixel data using GPUs.

We study firmware performance implemented in a prototype device, which has (up to) four optical input and eight lanes of PCI-express output. Data transfer throughputs for input line cases of one and four are measured 3.7Gbps and 11.8Gbps, respectively.

The first version card next to the prototype is under development and will be delivered by March 2012. Performance study of the first version card will also be presented as well.

Student? Enter 'yes'. See http://goo.gl/MVv53

no

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