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40 Gbps Readout interface STARE for the AGATA Project

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The Advanced GAmma Tracking Array (AGATA) multi detector spectrometer will provide precise information for the study of the properties of the exotic nuclear matter (very unbalanced proton (Z) and neutron (N) numbers) along proton- and neutron- drip lines and of super-heavy nuclei. This is done using the latest technology of particle accelerators. The AGATA spectrometer consists of a 180 high purity Germanium detectors. Each detector is segmented into 38 segments. The very harsh project requirements is to measure gamma ray energies with very high resolution < 1x 10 -3) @ high detector counting rate (50 Kevents / sec / crystal). This results in a very high data transfer rate per crystal (5 to 8 Gbps). The samples are continuously transferred to the CAP (Control And Processing Motherboard) module which reduces the data rate from 64 Gbps to 10 Gbps. The CAP module also adds continuous monitoring data which results in total outgoing data rate beyond 10 Gbps. The STARE module is designed to fit between the CAP module and the computer farm. It will package the data from the CAP module and transmit it to the computer farm using up to 4 x 10 Gbps UDP (User Datagram Protocol) connection with a delivery insurance mechanism implemented in the application layer.

Minioral

No

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No

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