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The Mu3e Data Acquisition

Monday 12 October 2020 15:00 (20 minutes)

The Mu3e experiment aims to find or exclude the lepton flavor violating decay $\mu^+ \to e^+e^-e^+$ with a sensitivity of one in 10^{16} muon decays. The first phase of the experiment is currently under construction at the Paul Scherrer Institute (PSI, Switzerland), where beams with up to 10^8 muons per second are available. The detector will consist of an ultra-thin pixel tracker made from high-voltage monolithic active pixel sensors (HV-MAPS), complemented by scintillating tiles and fibres for precise timing measurements. The experiment produces about 80 GBit/s of zero-suppressed data which are transported to a filter farm using a network of FPGAs and fast optical links. On the filter farm, tracks and three-particle vertices are reconstructed using highly parallel algorithms running on graphics processing units, leading to a reduction of the data to 100 Mbyte/s for mass storage and offline analysis. The talk introduces the system design and reports on progress in building and testing the hardware, firmware and software for this data acquisition system.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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