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【445】The Mu3e Fiber Detector Readout

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Mu3e is a dedicated experiment for the rare lepton flavour violating decay $\mu^+ \to e^+e^-e^+$. Its ultimate goal is to find or exclude this process if it occurs more than once in 10^{16} muon decays, a four orders of magnitude improvement.

A thin multi-layer scintillating fibre detector read out on both sides with silicon photomultiplier arrays provides a sub nanosecond time measurement in order to reject combinatorial background at a muon stopping rate ˜10^8 muon/s, concurrently minimizing the material budget to $X/X_0 <˜ 0.3\%$.

The requirements and design of its trigger-less high rate readout chain, including the dedicated readout chip MuTRiG, are presented. It complements the talk "The Mu3e Fiber Detector".

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