Contribution ID: **64** Type: **Poster presentation**

The Mu3e Scintillating Fiber Detector

Tuesday 9 September 2025 17:02 (1 minute)

The goal of the Mu3e experiment is to search for charged LFV in the muon decay $\mu^+ \rightarrow e^+e^-e^+$. The improvement of the sensitivity by 4 orders of magnitude compared to the limit set by the PSI SINDRUM collaboration 40 years ago, drives the need to suppress all sources of backgrounds to a level well below 10^{-16}. Accidental backgrounds can be strongly rejected by requiring very precise timing.
This will be achieved with a scintillating fiber detector (SciFi) in conjunction to scintillating tiles. The SciFi detector consists of 12 fiber ribbons made by staggering three layers of 250 μm round scintillating fibers, each with a time resolution of ~ 250 ps, an efficiency of $\sim 98\%$, and a thickness of $\sim 0.2\% X_0$ to minimize multiple scattering.
Each fiber ribbon is read out at both ends by 128 channel SiPM arrays coupled to MuTRiG ASICs, which are able to withstand single channel rates of up to 10^6 hits per second expected at 10^8 muon stops per second during the phase I of the experiment.
This poster will provide an overview of the features of the SciFi detector.

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Session Classification: Poster Session and BBQ