

Precision timing in the Mu3e experiment towards the search for the muon decay to three electrons

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Mu3e is an experiment under construction at the Paul Serrer Institute to search for the charged lepton flavor violating $\mu^+ \rightarrow e^+ e^- e^+$ decay at branching fractions above 10^{-16} . As this decay is heavily suppressed in the Standard Model, its observation would unambiguously indicate the existence of new physics. Achieving such sensitivity requires a high rate of muons and a detector with large kinematic acceptance; hence, excellent time resolution is essential to suppress the accidental background and to facilitate the global event reconstruction. In particular, the scintillating fiber (SciFi) sub-detector is mounted in the central Mu3e region and is designed to achieve a very precise time measurement with a very high efficiency and rate capability. In this talk, the SciFi design and performance is presented in the context of the demanding Mu3e detector requirements.

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