

The Mu3e Pixel-Tracker

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The Mu3e experiment at PSI will search for the Lepton Flavor Violating Decay $\mu^+ \rightarrow e^+ e^+ e^-$ with an unprecedented sensitivity of 1 out of 10^{16} decays. The Mu3e tracking detector has four layers of High Voltage-Monolithic Active Pixel Sensors (HV-MAPS) and exploits He-gas cooling and an ultra-light mass design with a thickness of 1 per mill of a radiation length per layer to fulfill the very stringent requirements from multiple Coulomb scattering. All registered hits are readout and reconstructed using an online event reconstruction.

The design of the MUIPX chip implementing a trigger-less readout architecture is presented together with recent results from test beam measurements obtained with the MUIPX7 chip, which represents a fully functional small scale HV-MAPS prototype of the final sensor. The layout of the ultra-light tracker modules is described and data transmission tests using thin aluminium-kapton flex-prints are presented.

Finally an outlook is given. Possible applications of the HV-MAPS technology, in particular of the MUIPX design, for upgraded LHC experiments and track trigger applications will be discussed.

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