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A Tracker for the Mu3e Experiment based on High-Voltage Monolithic Active Pixel Sensors

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The Mu3e experiment searches for the lepton flavour violating decay $\mu^+ \rightarrow e^+ e^+ e^-$, aiming for a branching fraction sensitivity of 10^{-16} . This requires an excellent momentum resolution for low energy electrons, high rate capability and a large acceptance. In order to minimize multiple scattering, the amount of material has to be as small as possible. These challenges can be met with a tracker built from high-voltage monolithic active pixel sensors (HV-MAPS), which can be thinned to $50 \mu\text{m}$ and which incorporate the complete read-out electronics on the sensor chip. To further minimise material, the sensors are supported by a mechanical structure built from $25 \mu\text{m}$ thick Kapton foil and cooled with gaseous helium.

The talk discusses the progress towards building this tracker in the areas of sensor development, mechanics and cooling.

quote your primary experiment

Mu3e

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