

The MuPix HV-MAPS system-on-chip for the Mu3e experiment

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Mu3e is a novel experiment searching for charged lepton flavor violation in the rare decay $\mu \rightarrow eee$. Decay vertex position, decay time and particle momenta have to be precisely measured in order to reject both combinatorial and physics background. A silicon pixel tracker based on 50 μm thin high voltage monolithic active pixel sensors (HV-MAPS) in a 1T magnetic field will deliver precise vertex and momentum information. The MuPix HV-MAPS chip combines pixel sensor cells with integrated analog electronics and a complete digital readout. The MuPix7 is the first HV-MAPS prototype having all functionality of the full sensor including a fast readout state machine and high speed serialization with 1.25 Gbit/s data output.

Measurements for the MuPix7 pixel sensor chip including $>98\%$ efficiency for the full system in a high rate beam test will be shown.

Primary author: WIEDNER, Dirk (Ruprecht-Karls-Universitaet Heidelberg (DE))

Co-authors: SCHONING, Andre (Physikalisches Institut-Ruprecht-Karls-Universitaet Heidelberg-U); PERREVOORT, Ann-Kathrin (Ruprecht-Karls-Universitaet Heidelberg (DE)); MEIER, Frank (Ruprecht-Karls-Universitaet Heidelberg (DE)); AUGUSTIN, Heiko Christian (Ruprecht-Karls-Universitaet Heidelberg (DE)); PERIC, Ivan (KIT - Karlsruhe Institute of Technology (DE)); HUTH, Lennart (Ruprecht-Karls-Universitaet Heidelberg (DE)); KIEHN, Moritz (Heidelberg University); BERGER, Niklaus Emanuel (Uni Mainz); DITTMIEIER, Sebastian (Ruprecht-Karls-Universitaet Heidelberg (DE))

Presenter: WIEDNER, Dirk (Ruprecht-Karls-Universitaet Heidelberg (DE))

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