



Contribution ID: 29

Type: Poster

## The power distribution system for the Mu3e experiment.

*Tuesday 22 October 2019 16:58 (1 minute)*

The first phase of the Mu3e experiment will search for the charged flavour violating decay of a positive muon into 2 positrons and one electron with a single events sensitivity of  $2 \times 10^{-15}$ . For this purpose, a DC muon beam will be stopped inside a Si pixel tracker constructed from High-Voltage Monolithic Active Pixel Sensors (HV-MAPS), complemented with timing detectors. The entire experiment resides within a superconducting solenoid providing a homogeneous magnetic field of 1 T.

A total of 3136 detectors ASICs need about 5 kW of power at ca. 2 VDC. In addition, frontend boards equipped with an ARRIAV FPGA will configure and read out these sensors and send off the data via optical links, adding another 2.7 kW. The power distribution system has to step down the 20 VDC supply voltage to the different DC voltages needed. Custom buck converters equipped with air coils will do this inside the magnet, as close as possible to the detector to avoid further power losses. Special care has to be taken to minimize interference between these high power devices and the sensitive tracker nearby.

**Author:** WAUTERS, Frederik (Johannes Gutenberg University Mainz)

**Presenter:** WAUTERS, Frederik (Johannes Gutenberg University Mainz)

**Session Classification:** BBQ - Drinks & Posters