

DC-DC conversion powering schemes for the upgrade of the CMS tracker

The CMS experiment foresees upgrades of its silicon pixel and strip detectors for the luminosity upgrade of the LHC. Due to an increase in the number of readout channels and higher complexity larger currents will have to be provided to the detector. Since cable channels are hardly accessible and space for cables is limited, this would lead to excessively large resistive power losses in the supply cables, which increase with the current squared. CMS has therefore chosen a novel powering scheme based on DC-DC converters, which allows to deliver the power at a higher voltage and consequently lower current.

Based on radiation-tolerant DC-DC buck converter ASICs from the CERN electronics group, we develop low-mass, low-noise DC-DC converters for the application in CMS. The talk will cover studies of switching noise, magnetic emissions and power efficiency as well as system tests with silicon strip and pixel modules. A scheme for the integration of DC-DC converters in the silicon pixel detector, currently foreseen to be exchanged around 2016, will be presented.

Auteur principal: Dr KRAMMER, Manfred (HEPHY, Vienna)

Orateur: Mlle KLEIN, Katja (RWTH Aachen University)

Classification de th matique: Detector R & D and data handling