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Digital measurement system for the klystron HV modulator

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Important HV electrical parameters of the LHC klystron amplifier are monitored by the control system. The currents are measured by external DCCTs on HV cables at ground potential, voltage dividers are isolated by V to f converters. The system performs well, but many components are at the end of their lives and measurement accuracy and access to the data for trouble shooting could be improved.

A new, state of the art digital measurement system, which allows to measure all important HV quantities directly at the source in the HV tank (Vcath, Icath, Vma, Vheater, Iheater...) was developed. It provides 3 orders of magnitude improvement in sample rate, 10 fold increase in accuracy and comfort of online observation and post mortem buffers.

We have demonstrated, that we can introduce and run a sophisticated electronic devices into the harsh HV environment. They provide reliable data even during very energetic fault scenarios, e.g. crowbar or arcing. A prototype will be installed in the LHC klystron HV modulator for long time testing in the coming run 2.

Primary author: Dr VALUCH, Daniel (CERN)

Co-authors: MIKKELSEN, Anders (Bergen University College (NO)); RAVIDA, Gianfranco (CERN); BRUNNER, Olivier (CERN)

Presenter: Dr VALUCH, Daniel (CERN)

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