

# HGCROC-V2: the front-end readout ASIC for the CMS High Granularity Calorimeter

*Monday 25 May 2020 14:54 (18 minutes)*

HGCAL, presently being designed by CMS to replace the endcap for the High Luminosity LHC, require extremely challenging specifications for the front-end electronics: high dynamic range, low noise, high accuracy time information and low power consumption as well as the need to select and transmit trigger information with a high transverse and longitudinal granularity.

HGCROC-V2 is the second prototype of the front-end ASIC. It has 72 channels of the full analog chain: low noise and high gain preamplifier and shapers, 10-bit 40 MHz SAR-ADC, which provides the charge measurement over the linear range of the preamplifier. In the saturation range of the preamplifier, a discriminator and TDC provide the charge information from TOT (200 ns dynamic range and 50 ps binning). A fast discriminator and TDC provide timing information to 25 ps accuracy.

We will report on the performances about: noise, charge and time performances, DAQ and Trigger paths, TID and SEU.

## Funding information

**Authors:** Mr THIENPONT, Damien (OMEGA - Ecole Polytechnique - CNRS/IN2P3); DE LA TAILLE, Christophe (OMEGA (FR))

**Presenter:** Mr THIENPONT, Damien (OMEGA - Ecole Polytechnique - CNRS/IN2P3)

**Session Classification:** Readout: Front-end electronics

**Track Classification:** Readout: Front-end electronics