CMS Phase 2: HIN works needed

MITHIG

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Detectors + L1

We expect the upgraded CMS detectors to be able to operate in high multiplicity environment without all the configuation/FW changes needed for Run1-3

- Checks to the electronics should be anyway carried out
- Deal with not upgraded detectors e.g. HF
- Integrate and operate forward detectors ((PPS),ZDC, FSC), see Gian Michele/Yen-Jie talk
- Integrate and with MTD

L1 is expected to run at 750 kHz (+ 40 MHz data scouting) so we should be able to accept the entire hadronic cross-section and a fraction of the UPC one

- Integrate in L1 system the specific HI detector. E.g. ZDC , FSC(?)
- Integrate the specific L1 algorithms: MB trigger, centrality, asymmetry
- Integrate HI needs in data scouting
- Any fancy ML algorithm

NGT and DATA COMPRESSION

The NGT will allow more power for triggering

- Implemente HI algorithms
- Any fancy ML algorithm

As of today CMS HI program is expected to write 7.5 kHz (3 kHz) of data to disk

- The transfer system is planned for 60 GB/s (R+W) and the actual CMS event size passed from 3 to 10 MB/ev
- CMS DAQ TDR: https://cds.cern.ch/record/2759072/files/CMS-TDR-022.pdf

- Data reduction with RAW”
- Data reduction performing full tracking in NGT and store only reconstructed taks
- Compression workflow

Reconstruction algorithms: only base prototype exist