



# Overview and Present Status of the CMS Phase 1 Pixel Upgrade

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Luminosity is foreseen to increase to 2x design value of current pixel detector ( $10^{34}\text{cm}^{-2}\text{s}^{-1}$ ) during Run 2

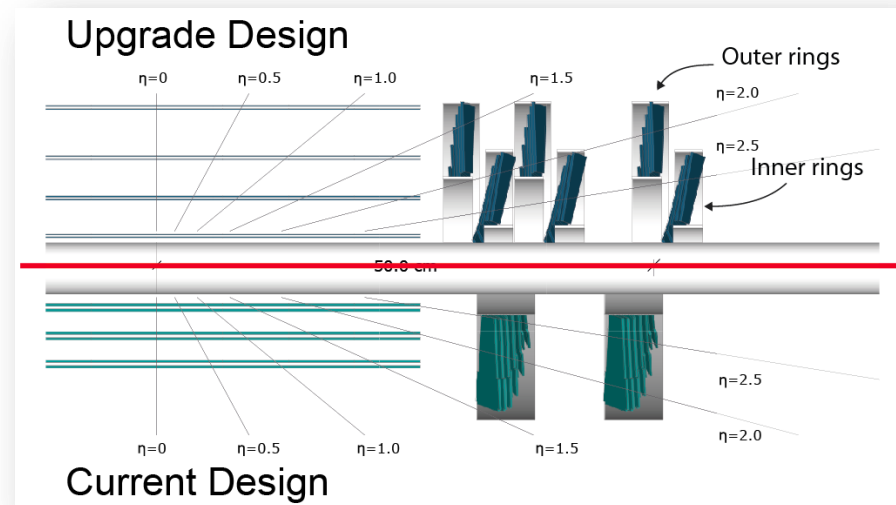
Pixel detector to be exchanged in 2016/2017 year end extended shutdown

The poster shows

- Layout of the new CMS pixel detector & expected performance improvements
- Design of a pixel module
- Changes to the read out chip

The module production is described

- Involved institutes
- Assembly sequence
- Module quality assurance



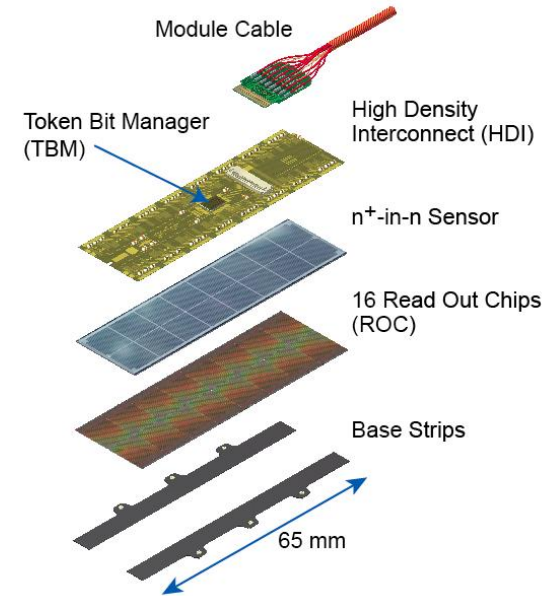
- Detector mass halved: i.a. lightweight support structure, 2-Phase CO<sub>2</sub> cooling
- New powering scheme using DC-DC converters

Module design similar to current one

- New read out chip was developed
  - > Increased single hit efficiency:
    - Larger data and timestamp buffers
    - 160 MHz digital read out
    - On-Chip ADC for pulse height sampling

Pixel module **series production is about to start**

- More than 20 production centers involved
- Prototypes have been built
- A test sequence for grading produced modules has been developed and validated
  - Electrical tests, thermal cycling, X-Ray tests



Energy calibration

