



Contribution ID: 357

Type: **Poster**

## **The phase 1 upgrade of the CMS pixel detector: qualification of barrel pixel detector modules**

*Monday 8 August 2016 18:30 (2 hours)*

The CMS experiment at the LHC will substitute its pixel detector during the extended winter shutdown in 2016-17, with an upgraded detector which is now being built. An additional layer in the barrel region and an additional disk in each of the end caps is featured in the new geometry introduced by the phase 1 upgrade of the pixel detector. In order to withstand the higher rates of Runs 2 and 3 of the LHC, where instantaneous luminosities up to  $2.0 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$  are expected, new digital readout chips and improved front-end electronics are introduced. The features of the upgraded detector are presented, along with a comparison and of its performance with respect to the current one. The production of the new Barrel pixel (BPix) detector modules is reviewed with a focus on the qualification process developed to assess the quality of the assembled modules produced. New BPix detector modules undergo performance and quality tests and calibrations in a temperature and humidity controlled environment, whose details will be presented, together with a description of the testing setups. Motivations for the choice of particular figures of merit to assess module quality will be given and a summary of results from the current status of the production of BPix modules for Phase I Upgrade will be presented.

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**Session Classification:** Poster Session

**Track Classification:** Detector: R&D and Performance