

CMS Phase-1 Pixel detector refurbishment during LS2 and readiness towards the LHC Run-3

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The CMS Phase-1 pixel detector was extracted from the underground cavern after the end of the LHC Run-2 in 2019 and has been kept cold to protect the silicon sensors during the long shutdown period (LS2) in 2019-2021. The LHC is now preparing for the next installment of the data taking beginning 2022. The Phase-1 pixel detector is scheduled to be installed this year and is going through a series of refurbishment and repairs to improve the quality of the collected data and enhance the operational experience. The innermost barrel layer has been replaced with new modules and features improved readout chips (PROC600v4), front-end ASICs (TBM10d), and circuit boards to rectify the issues discovered during the previous data taking. The forward pixel detector has been equipped with new cooling inlets for safe handling and features a revised high-voltage power distribution scheme to better match the low-voltage granularity. All the DC-DC converters have been replaced with a new production, consisting of an improved ASIC (FEAST2.3) to prevent them from breaking during operation. Overall, this talk will summarize the refurbishment work of the pixel detector during LS2, and highlight the readiness towards the LHC Run-3 after installation and commissioning.

Your name

Atanu Modak

email

atanu.modak@cern.ch

Title

Mr

Nationality

Indian

Institute

Kansas State University

Author: Mr NOEHTE, Lars

Presenter: Mr NOEHTE, Lars

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