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The Phase 2 upgrade of CMS Inner Tracker

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A new Silicon Tracker will be built for the Phase 2 Upgrade of the CMS experiment to fully exploit the increased luminosity delivered by HL-LHC. The innermost part, called the Inner Tracker, will be exposed to extreme conditions such as unprecedented radiation levels of 1.2 Grad and 2E16 neq/cm2 and hit rates of 3.2 GHz/cm2. The new Inner Tracker relies on many novel solutions and technologies that allow for a design of a light and radiation-hard pixel detector of high performance. The hybrid pixel modules will be composed of pixel sensors with pixel size of 2500 um2 and new ASIC, designed in 65 nm CMOS technology, developed by the RD53 collaboration. A novel scheme of serial powering will be deployed to power the pixel modules and new technologies will be used for a high bandwidth readout system. The mechanics will be lightweight, based on carbon-fibre material and two-phase CO2 cooling. In this contribution, the design of the CMS Inner Tracker system will be presented along with the prospective design choices.

Submission declaration

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