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## Performance analysis of phase 2 Tracker upgrade Ps Module before and after irradiation

The Large Hadron Collider will undergo a luminosity upgrade targeting a peak instantaneous luminosity ranging from  $5-7.5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ . The ambitious goal of the High Luminosity LHC is to achieve a total of  $3000-4000 \text{ fb}^{-1}$  of proton-proton collisions at a center-of-mass energy of 13–14 TeV by 2029. To cope with such challenging environmental conditions, the outer tracker of the CMS experiment will be upgraded using closely spaced silicon sensors (pixels and strips) to provide tracking information at the Level-1 trigger. A PS-Module, composed of both a pixel and a strip sensor, was tested at the Fermilab Test-Beam Facility to evaluate its ability to provide accurate tracking information, Pt discrimination capabilities, and optimal performance at the irradiation levels expected after being exposed to the harsh conditions of the High Luminosity LHC. The results of the test and the comparison of the module performance before and after irradiation will be presented in this poster.

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