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Test Beam Studies of 3D Pixel Sensors for the CMS Phase-2 Upgrades and Measurement of the Beam Telescope Resolution at Fermilab JOSEPH REICHERT, Cornell Laboratory for Accelerator-based Sciences and Education, CMS COLLABORATION — The innermost tracking detector of CMS, the pixel detector, will be replaced in the mid-2020s in preparation for the high-luminosity run of the Large Hadron Collider (HL-LHC). The HL-LHC will deliver a total integrated luminosity which is more than a factor of ten larger than the current LHC will deliver to CMS, which necessitates the use of silicon pixel sensors that perform well even after radiation fluences as large as 2×10^{16} n_{eq/cm^2}. 3D silicon pixel sensor technology is being considered for use by CMS, and this talk will present studies of these 3D sensors performed at the Fermilab Test Beam Facility (FTBF). In addition, a measurement of the FTBF telescope resolution will be presented, which relies on the small charge sharing distances intrinsic to the 3D pixel sensor technology.

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