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CMS Drift Tube (DT) upgrade at High-Luminosity LHC

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The High-Luminosity Large Hadron Collider (HL-LHC) project aims to boost the performance of the LHC in order to increase the potential for discoveries for LHC Run-4 and onwards. The upgrade aims at increasing the instantaneous luminosity of the machine. In order to cope with the expected increase of both radiation and rates, the electronics that host the first level of readout and trigger electronics of the Drift Chambers in CMS must be replaced with the new On-Board electronics for DT (OBDT). The time digitization (TDC) data will be streamed directly to the new backend electronics hosted in the service cavern, where event building and trigger primitive (TP) generation will be performed using the latest commercial FPGAs exploiting the ultimate DT cell resolution. In order to develop and test Phase-2 architecture, a parallel readout of Phase-2 and legacy electronics was set up through front-end splitting on a full DT sector in one external wheel. A series of tests aiming to optimize installation in LS3 were performed. In this report, the motivation for such an upgrade will be highlighted, and the status of the DT slice-test operation, as well as its performance assessed with cosmic-ray events, will be presented.

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