

The High-Granularity Timing Detector proposed for ATLAS Phase II

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The HL-LHC will produce around 200 pp interactions in each bunch crossing, and maintaining the reconstruction performance in this harsh environment is one of the most important experimental challenges to overcome for a successful ATLAS physics program. At the same time, big investments are done to equip the forward region up to $|\eta| < 4$ with tracking capabilities with the ITk. The High-Granularity Timing Detector is a proposed detector for the Phase II upgrade which will help associate tracks in the forward region to the correct primary vertex by exploiting the time spread of the interactions. Through this the performance of pileup-jet tagging, flavor tagging and lepton isolation is improved dramatically to levels similar to those observed in the barrel region. In addition, this low-occupancy detector is a powerful luminometer capable of providing high-precision bunch-by-bunch luminosity measurements both online and offline.

Summary

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