

Expected performance of the upgraded ATLAS experiment for HL-LHC

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The Large Hadron Collider (LHC) has been successfully delivering proton-proton collision data at the unprecedented center of mass energy of 13 TeV. An upgrade is planned to increase the instantaneous luminosity delivered by LHC in what is called HL-LHC, aiming to deliver a total of up 3000/fb to 4000/fb of data per experiment. To cope with the expected data-taking conditions ATLAS is planning major upgrades of the detector.

It is now a critical time for these upgrade projects and during the last year and half ATLAS six Technical Design Reports (TDR) were produced by the ATLAS Collaboration. In these TDRs the physics motivation and benefits of such upgrades are discussed together with details on the upgrade project itself.

In this contribution we review the expected performance of the upgraded ATLAS detector and the expected reach for physics measurements as well as the discovery potential for new physics that is expected by the end of the HL-LHC data-taking. Performance of object reconstruction under the expected pile-up conditions will be shown, including a fully re-optimized b-tagging algorithm. Important benchmark physics projections including di-Higgs boson production sensitivity will be discussed.

Primary author: DE LA TORRE PEREZ, Hector (Michigan State University (US))

Presenter: DE LA TORRE PEREZ, Hector (Michigan State University (US))

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