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Hunting for Beyond-Standard-Model physics with the ATLAS detector at the 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 about 3000/fb of data to the ATLAS detector at a center of mass energy of 14 TeV. To cope with the expected data-taking conditions ATLAS is planning major upgrades of the detector.

In this contribution we present an overview of the physics reach expected for a wide range of measurements and searches at the HL-LHC for the ATLAS experiment, with particular focus on the expected reach for phenomena beyond what predicted by the Standard Model. Direct searches as well as indirect constraints from precision measurements will greatly expand our reach for a variety of candidate Beyond-Standard-Model theories.

Such studies formed the basis of the ATLAS Collaboration input to the recent HL/HE-LHC Yellow-Report. An executive summary of this report was then submitted as input to the European Strategy process.

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