

Phenomenology 2018 Symposium



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Measuring the Higgs Trilinear Coupling at an HE-LHC

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Measuring the Higgs self-coupling at the LHC has proven to be extremely challenging in the Standard Model, making such a measurement a primary target for future 100 TeV colliders. We explore an alternative scenario, where the LHC is upgraded to 27 TeV —the so-called “High-Energy”(HE)-LHC. We demonstrate the capabilities of such a 27 TeV proton collider at measuring the Higgs self-coupling via di-Higgs production in the $b\bar{b}\gamma\gamma$ channel. Our projections are based on a full simulation of the detector performance using Delphes, based on the current projected performance for the ATLAS detector at HL-LHC, with simulations of all signal and relevant backgrounds. We find that a 5σ discovery of di-Higgs production is possible at a 27 TeV collider, which corresponds to a $\sim 40\%$ measurement of the trilinear coupling in the $b\bar{b}\gamma\gamma$ channel alone.

Summary

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