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Measurement of the Higgs boson off-shell coupling to constrain the total width in the ZZ final state with the ATLAS detector

Monday 7 September 2020 19:04 (6 minutes)

After the Higgs boson observation, a number of measurements have been performed to quantify the properties of this particle. Even though there is strong evidence that the observed particle is the Higgs boson predicted by the Standard Model (SM), there is still space for Beyond SM candidates. Efforts to measure the properties of the Higgs boson are primarily focused on on-shell production. However, above 125 GeV off-shell production of the Higgs boson has a substantial cross section at the LHC, due to the increased phase space as the vector bosons (V = W, Z) and top quark decay products become on-shell with the increasing energy scale. Off-shell production can provide sensitivity to new physics that alters the interactions between the Higgs boson and other fundamental particles in the high-mass region. The SM Higgs boson has a narrow total width, approximately 1000 times smaller than the current detector resolution, being impossible to measure it directly at the Large Hadron Collider (LHC). A measurement of the relative off-shell and on-shell event yields provides direct information about the Higgs boson total width, if one assumes identical on-shell and off-shell Higgs boson coupling modifiers.

Is this abstract from experiment?

Internet talk

Yes

Name of experiment and experimental site

Is the speaker for that presentation defined?

Details

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