

Higgs self-coupling measurements at the FCC-hh

The hadron collider phase of the Future Circular Collider (FCC-hh) is a proton-proton collider operating at a center-of-mass energy of 100 TeV. It is one of the most ambitious projects planned for the rest of this century and offers ample opportunities in the hunt for new physics, both through its direct detection reach as well as through indirect evidence from precision measurements.

Extracting a precision measurement of the Higgs self-coupling from the Higgs pair production cross-section will play a key role in our understanding of electroweak symmetry breaking, as the self-coupling gives insight into the nature of the Higgs potential. With the large dataset of 30 ab^{-1} which is envisioned to be collected during the FCC-hh runtime the Higgs self-coupling will be determined down to the percent level.

This talk presents recent studies of di-Higgs measurements in various final states (e.g. $bb\gamma\gamma$, $bb\tau\tau$, $bbWW$) and their combination. More challenging final states, such as $bbllE_T^{\text{miss}}$ are explored for their potential at the FCC-hh for the first time. Updates to the parametrization of detector scenarios for a project so far ahead in the future are discussed as well.

Primary authors: TALIERCIO, Angela; STAPF, Birgit; MASTRAPASQUA, Paola (UCLouvain)

Presenters: TALIERCIO, Angela; STAPF, Birgit; MASTRAPASQUA, Paola (UCLouvain)

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