Contribution ID: **82** Type: **not specified**

CP-sensitive simplified template cross sections for ttH

Tuesday 12 December 2023 12:00 (20 minutes)

The CP structure of the Higgs boson is a fundamental Higgs property which has not yet been constrained with high precision.
CP violation in the Yukawa coupling between the Higgs boson and the top quark can be probed directly at the Large Hadron Collider by measuring top-quark-associated Higgs production. Multivariate analysis techniques are designed for a specific signal model and, therefore, complicate reinterpretations and statistical combinations between experiments.
With this motivation in mind, we propose in this work a CP-sensitive extension of the simplified template cross-section framework.
Considering multiple Higgs decay channels, we perform an in-depth comparison of CP-sensitive observables and combinations thereof. We present options to extend the existing binning in the transverse momentum of the Higgs boson by a second dimension. A selection of candidate observables are presented as possible choices.

Primary authors: CARNELLI, Alberto (IRFU, Saclay, DPhP); Dr KOTSOKECHAGIA, Anastasia (IRFU, Saclay, DPhP); FUCHS, Elina (CERN); Dr DELIOT, Frederic (IRFU, SPP, Saclay); Dr BAHL, Henning (Chicago U., EFI); Dr SCHOEFFEL, Laurent (DAPNIA, Saclay); MENEN, Marco; Dr SAIMPERT, Matthias (IRFU, Saclay, DPhP)

Presenter: CARNELLI, Alberto (IRFU, Saclay, DPhP)

Session Classification: Higgs Parallel

Track Classification: Parallels: Higgs physics