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Off-shell Interpretations Task Force

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Off-shell Interpretations Task Force

If you would like to join, please let us know.

Task force e-group: lhc-higgs-offshell-interpretations
You may sign up here (search for "lhc-higgs-offshell-interpretations")
email address: lhc-higgs-offshell-interpretations@cernNOSPAMPLEASE.ch

General information: intro_slides.pdf

Write-up: GitLab

Covid-19-related measures imply that the original deadline is not realistic. The new deadline for the first version of the documentation is December 2021.

General Meetings

1 December 2021 Indico link
9 November 2020 Indico link

Joint Meetings

23 September 2020 Indico link
8 July 2020 Indico link
16 April 2020 Indico link
10 March 2020 Indico link

Discussion Points

• Which models/EFTs should be investigated with what priority? (subgroup 1)
  ♦ Theory feedback on (EFT) models used in experimental analyses
  ♦ Update Theory status in light of experimental progress (slightly outdated papers)
  ♦ Adam, Alex, Andrei, Ashley, Christophe, Dermot, Eleni, Ennio, Jorge, Nicolas P., Nicolas K., Pascal, Rafael, Uluscan, Li Yuan (cc: WG2 conveners)
  ♦ TWiki page: HiggsOffshellInterpretationsModels
  ♦ Write-up: GitLab
  ♦ e-group: lhc-higgs-offshell-interpretations-models

• global EFT fits compatibility: tools to convert results and for validation
  ♦ aim for compatibility and consistency early on; would be helpful to highlight issues with a concrete example
  ♦ discuss in subgroup 1

• Event generators/programs comparison, recommended prescriptions, are they available in the experimental tool chains? (subgroup 2)
  ♦ MadGraph (cross-checked against SMEFTsim), MCFM-derived
  ♦ Andrei, Eleni, Lailin, Mostafa, Nicolas P., Pascal, Uluscan, Jerry (cc: WG2 conveners)
  ♦ TWiki page: HiggsOffshellInterpretationsSimulation
  ♦ Write-up: GitLab
  ♦ e-group: lhc-higgs-offshell-interpretations-simulation
  ♦ Meetings (Indico links): 19 May 2020, 22 October 2020

• Jet-binning and associated uncertainties (Theory, others)
  • see also Precision Discussion
  • Andrei G., Andrey P., Ashley, Lailin, Martina, Jay, Nicolas P., Pascal, Raoul, Uluscan (cc: WG2 conveners)
BSM higher order effects in EFT
- studied for tree-level processes w/ MadGraph, loop-level: only gg → H on-shell (125 GeV);
- EFT K-factor similar to SM K-factor; going beyond is complicated
- revisit later

Precision Discussion (separately):
- Higher order QCD K factors for gg → VV (S, B, I)
- Higher order QCD K factors for VBF/VH → VV (S, B, I)
- Theory uncertainty treatment for non-interfering background channels
  (full NLO QCD+EW corrections to the non-interfering VV background: how to take into account/tools/uncertainty; methods to reduce uncertainty due to EW corrections)
  - correlation between uncertainty of different non-interfering backgrounds?; conservative uncertainty assumptions being used by experiments
  - MATRIX: arXiv:1912.00068
  - desirable: uncertainty prescription supported by theorists
- Theory uncertainty treatment for interfering contributions/channels
- Top quark mass effects on the signal and continuum
- Jet-binning and associated uncertainties (Theory, others)
- BSM higher order effects in EFT

Task Force Members

ATLAS:

Lailin Xu (Brookhaven BNL)

ZZ: Rafael Coelho Lopes De Sa (UMass Amherst), Martina Javurkova (UMass Amherst), Jay Sandesara (UMass Amherst), Ashley Mc Dougall (NIKHEF Amsterdam)

WW: Spyros Argyropoulos (U. Freiburg)

CMS:

Savvas Kyriacou (JHU Baltimore)

ZZ 2l2nu: Pascal Vanlaer (UL Bruxelles), Li Yuan (BUAA Beijing), Andrey Popov (UL Bruxelles), Sicheng Wang (UC Santa Barbara), Nicolas Postiau (UL Bruxelles), Mostafa Mahdavikhorrami (UL Bruxelles), Hanwen Wang (BUAA Beijing & UL Bruxelles) Jerry Ling (UC Santa Barbara, until August)

ZZ 4l: Andrei Gritsan (JHU Baltimore), Savvas Kyriacou (JHU Baltimore)

WW: Xavier Janssen (U. Antwerp), Dermot Moran (CIEMAT Madrid)

Theory:

Aleksandr Azatov (SISSA), Jorge de Blas Mateo (IPPP Durham), Adam Falkowski (LPT Orsay), Christophe Grojean (DESY & Humboldt U.), Nikolas Kauer (U. of London), Raoul Röntsch (CERN), Ennio Salvioni (CERN), Eleni Vryonidou (CERN)
Related Working Groups

- WG2 Higgs Properties of the LHC Higgs Cross Section WG
- LHC EFT Working Group under the LPCC (kick-off discussion)

This topic: LHCPhysics > HiggsOffshellTaskForce
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