Some personal considerations

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Disclaimer

- Personal considerations from an experimentalist point of view
  - Not sure they all make sense
  - **NOT CMS-endorsed, NOT CMS statements**
- Much work on this already in progress in various WGs
  - This WG could provide additional expert-opinion that the other WGs could use at their profit
  - A cross-working-group effort analogous to cross-analysis-group efforts within experiments?
Uncertainties

- *EFT effects should be incorporated not just on signals, but also backgrounds to these signals [...] for consistency, and is particularly relevant in tails of distributions* (Veronica Sanz)

- Important to sensibilize the community about the need of accounting for effects on background (Andrea Giammanco)

- I think this also has implications for the statistical modelling of systematic uncertainties
  - Propagating effects to background is quite straightforward
  - From independent S and B normalizations to modelling a change of signal fraction
  - So far uncertainty in the parameterization (from fits to extract parameterization) is ridiculously small
  - Can it grow if effects on background are added? Is the effect on background supposed to be quadratic too?

- We parameterize weights from EFT parameters generated at LO
  - When applying that to NLO samples can have large corrections (discussed at the PREFIT school apparently?)
  - Additional uncertainty? Do we know the shape of that uncertainty?
    - Is it a continuous effect → continuous nuisance parameter (NP) p.d.f.?
    - Or is it a two-point systematic, with no (or not trivial) interpolation?
    - Assuming “variations” are provided, would need to know how to interpolate them to obtain a continuous NP p.d.f.
  - Other additional uncertainties to describe lack of consensus on some prescriptions?
    - Should we worry for the tails (low-statistic effects might inflate/deflate uncertainty artificially)

- Can all of these variations be treated with production of MC weights to be applied to nominal samples?
  - Faster and would be particularly significant for very large background samples

- This WG could be a place for harmonizing work and discussions on this!
review in more detail the procedures used by the experiments to define the domain of applicability of the EFT regime, particularly for complex fiducial analyses with different cuts etc (The current document draft)

Harmonization of fiducial cuts across experiments (whenever possible) already pushed for in the various WGs

- LHC Reinterpretation Forum has experience on this (Nick Wardle)

This WG could provide suggestions for EFT-optimized phase spaces

- Alert theoreticians on which fiducial definition they should better produce (differential) predictions for, thus reducing duplication whenever possible

The existing WGs could then integrate these suggestions with their EFT-aspecific agreements/definitions

- EFT results (particularly for combinations) could use these community-wide fiducial space definitions/recommendations
- Change of basis usually also performed within the experiments to produce reparameterized results

Indirect effect also helping smooth(er) combinations down the line
THANKS FOR THE ATTENTION!
Backup