
Note on truncation, validity and uncertainties

summary of comments and
points for discussion

google doc with comments: [here](#)

General points

- estimating $d \geq 8$ effects **requires introducing some assumption**
- we need to ensure **model-independence** of the measurements and **re-interpretability** in the future
- as much as possible, consider EFT *in its own merit* w/o relying on specific UV models
- add a **theoretical uncertainty** to cover for $d \geq 8$ effects (+ higher orders etc)?
A, B: 👎 C: 👍
- what should these recommendations apply to?
interpretation? combinations?

Shepherd

“Quadratics”

- incomplete set of Λ^{-4} contributions, but **univocally defined** in principle can be translated between different dim-6 bases
- violate **gauge invariance**? Shepherd
- should be retained in **signal** or not?
A, B: 👍 C: 👎
- are linear-only fits feasible? How costly computationally?
- how are linear / quadratic parameterizations defined for processes with a **production * decay** structure? e.g. Higgs or top measurements

Dimension 8

- where available, **knowledge** of dim-8 terms should be used for truncation error estimate, or even signal?
if signal, then error band requires dim-10 etc..
- including dim-8 in fits can **impact significantly dim-6 constraints**
eg. Drell-Yan
 - is data able to constrain both?
 - relative size depends on UV model
- what to do with **analyses** that have been performed **with a subset of $d=8$ operators** so far (e.g. VBS, VVV)?
can they be incorporated? can we learn something from them?
how should dim-8 be handled in this case? dim-8 and dim-6 fitted simultaneously?

Corbett,
Shepherd

Boughezal,
Mereggetti, Petriello

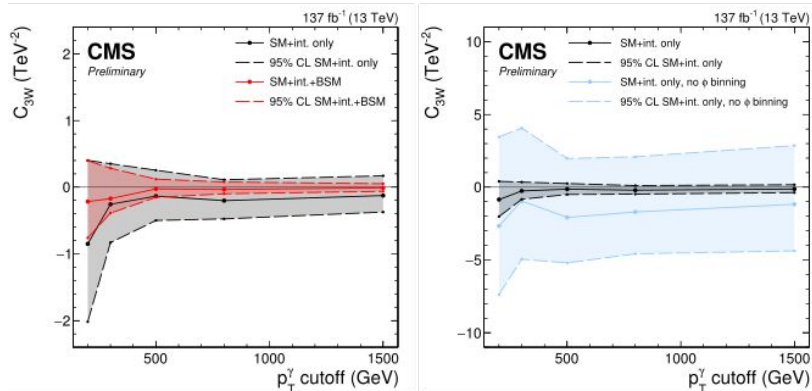
Bhattacharya

Clipping (A, B)

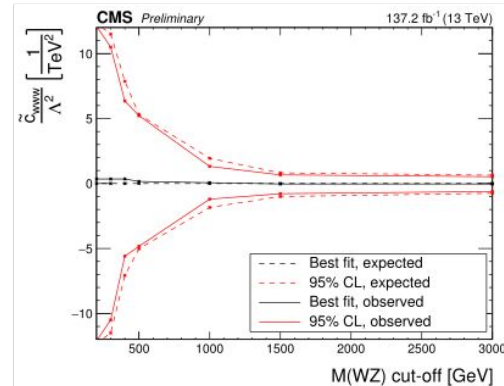
- how is the kinematic **variable** for the cut chosen?
need good proxies to Q^2
- how does one choose **consistent** variables & cuts in **combinations**?
example: STXS. p_{TH} in VBF \neq p_{TH} in ggH \neq in VH Gritsan, Berger
- redesigning analyses to clip data is computationally **expensive** Gritsan
- **clip EFT signal** instead? Gritsan, Berger
 - is comparing clipped EFT signal with unclipped data generally consistent?
 - do the measured and clipped observables need to coincide?
 - questions above remain Durieux

Clipping examples

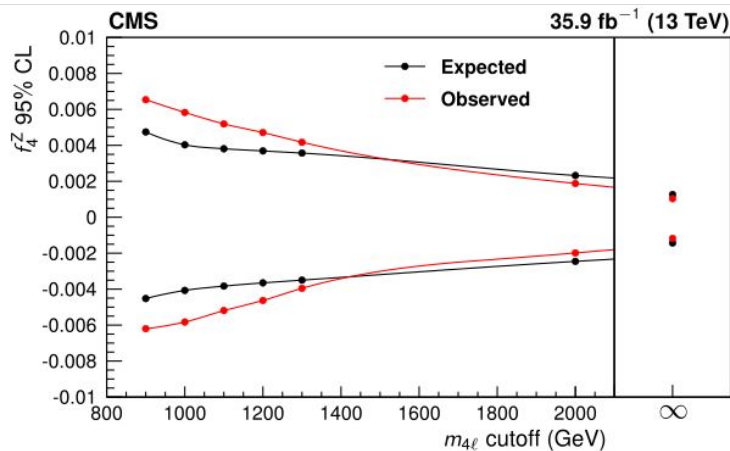
$W\gamma$ [CMS-SMP-20-005]



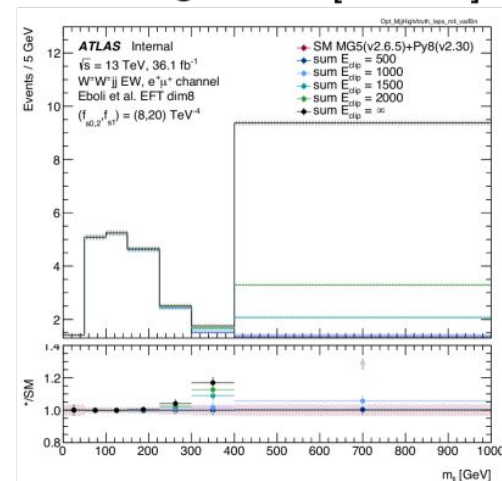
WZ [CMS-SMP-20-014]



ZZ [CMS-SMP-16-017]



same-sign WW [ATLAS]



[SMP-20-005](#)
[SMP-20-014](#)
[SMP-16-017](#)
[ssWW ATLAS](#)

from Gauthier

Error band (C)

- how is the **“power counting” rule** estimated?
is it model dependent? how general?
- how is the **kinematic shape** extracted from quadratics?
envelope?
- would this procedure embed assumptions into the measurement?
- computationally feasible to have an **uncertainty that depends on the parameters of interest?**
alternative: benchmarked error band independent of C_6 .
easier to undo in the future?