ggF task force

HXSWG1 kick-off meeting

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Time-scale

The ggF task force in its current form will operate until

the end of 2014

Goals

“The main responsibility of the "ggF task force" will be to review the status of the gg->H cross sections and distributions and identify what are the relevant questions from the theory side (for example, compare the different calculations for the inclusive cross section and propose a roadmap to a new recommendation) and the needs from the experimental side.”

Massimiliano & Robert

1.Inclusive XS

A host of new information that pushes the theoretical prediction towards the **N3LO** accuracy has been appearing (continuously) during the last year.

Clearly there is the need to review the HXSWG recommendation. We propose to organize a topical meeting (a debate) dedicated to the inclusive cross section and its uncertainties.

1a. The Inclusive XS debate

when

at some point at the mid to end of October

how

- all authors of inclusive predictions should (are warmly invited to) participate.
- a small set of benchmark scenarios with fixed parameters and conventions will be prepared in advance, so that we can compare the numerical impact of all predictions.
- pros and cons for each approach will be prepared in advance, that summarize its standard arguments.
- a lot of time will be allocated for discussion.

1b. Software benchmarking

We'd like to initialize a procedure to benchmark all existing software (public or private) that produces total inclusive predictions (or individual contributions) to gluon fusion.

The goal is to have a public repository of benchmarked programs, accessible from the HXSWG web page. Benefits:

- Recommended predictions don't have to be published in long, detailed tables.
- Non-recommended predictions can readily be compared with the recommended ones.
- A robust validation source for future implementations.

This is not as trivial as one might think!

2. Exclusive cross-sections

(and their uncertainties)

There has been a lot of discussion over the theory uncertainties in the presence of jet vetos, within the HXSWG (see YR2 and YR3 in particular).

Since the last YR, there are also a series of papers on the topic. We would like to continue the discussion and try to reach a consensus for a recommendation here as well.

3.Differential distributions

Here, too, a lot of work has been already done, especially comparing the Higgs pT distribution predictions between NNLO +NNLL and parton showers. We will want to update this discussion in view of the upcoming completion of the H+j computation.

Aside from that, we need

- from the experiments: a prioritized list of distributions that will be populated with data in the next years, or are used as theory input during the experimental analysis.
- from WG2&3: suggested distributions that are particularly sensitive to BSM effects.

and then for these distributions we'll provide a systematic comparison between fixed order, fixed order + resummation, and MC predictions.

All the above are our initial proposals for action.

We'd be happy to receive your input on how to reach consensus on concrete recommendations for ggF.

Thank you for your attention