

HF@LHC 2017

Heavy Flavour Production at the LHC

IPPP Durham, 6–8 Sept 2017



Welcome

Welcome to the second HF@LHC workshop!

A short meeting on aspects of heavy flavour process modelling and measurement at the LHC:

- ▶ Top quark physics modelling, particularly QCD corrections
- ▶ b and charm production in various processes
- ▶ Fragmentation and hadronisation of heavy quarks
- ▶ Heavy flavour and Higgs searches
- ▶ ...and where do we go from here?

20 min slot for each talk + 10 min discussion time

The discussion is centrally important, not incidental! Please keep to time, and tee-up topics for debate

Your issues

More hot topics for discussion, to be threaded in over next two days:

Please enter any issues relating to heavy flavour that you would love to have discussed/resolved. As many as you like, or submit the form multiple times

9 responses

What are the best kinds of groomed jet observables for improving theory/MC constraints on gluon splitting \rightarrow bb?

Can we agree on MC/fiducial definition(s) of "physical" top quarks, up to certain well-defined ambiguities? E.g. a "Born top", to be identified with a new status code when applicable.

Measurement suggestions to constrain $g \rightarrow$ bb modelling.

More efficient ways to generate tt+bb events? Thinking specifically about for example Section 2.3 in <https://arxiv.org/abs/1605.08352>, using biased kernels in Pythia8 in order to increase the production rate of heavy tt+bb from gluon splitting to thereby reduce the filter rate required and generate events faster

Merging processes with different jet multiplicities can be achieved at NLO in Madgraph with FxFx or in Sherpa with MEPS@NLO. FxFx has a limitation that "processes with jets or b quarks at the lowest multiplicity cannot be consistently merged" (cf. http://amcatnlo.web.cern.ch/amcatnlo/FxFx_merging.htm). Is this limitation general, for example does MEPS@NLO suffer from it? If so, is there any alternative?

<https://goo.gl/forms/5Ev8evP9XhWOKOnK2>

Your issues

More hot topics for discussion, to be threaded in over next two days:

J/psi octet singlet puzzle

What are the prospects for implementing a general purpose gluon splitting tagger? How sensitive are conventional taggers to these effects? There are questions about the appropriateness of using a tagging calibration that is derived in a particular final state to perform a measurement in a different final state, which might have a different gluon splitting fraction.

How sensitive are $H \rightarrow b\bar{b}$ analyses to the HF PDFs? In what way? What sort of improvement is needed in the PDF to make a significant improvement?

What expected impact can measurements performed at the LHC have towards improving the HF PDFs used at the LHC? I think about the PDFs as being an extrapolation of precise measurements at lower energies, where the precision of the LHC is worse but in the desired energy range. Are such LHC measurements worth the effort? What other measurements would benefit most?

<https://goo.gl/forms/5Ev8evP9XhWOKOnK2>

Please add to the document as you think of more issues during the talks and discussion

Tour

We will have the day's final guided tour of Durham Cathedral at 4pm sharp



We will leave here at 3.30, and walk to the cathedral
Please decide in advance what to do with your bag, etc.

Workshop dinner

Workshop dinner is at Akarsu (Turkish) on Silver Street at 7.30pm, after the Cathedral tour:



Food will be shared platters — vegetarians, please arrange to share together!

That's all!

On with the meeting...