

Summary of the Brainstorming Session

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Simulation tools LO/NLO:

Now we have MG5_aMC@NLO for simulating the H⁺ events. However the intermediate region instructions are for LO accuracy only. Since the cross sections have been calculated to NLO order, **would it be possible to have also NLO simulation for the intermediate region?**

Spira: work is going on and he claims that calculations have been done. This is to be checked. Spira also did some calculations. Please check his talk in the plenary session. Spira believes that the code exists and that the authors should be contacted. He added that ATLAS Higgs working group is using this code, however this has not been confirmed by ATLAS/CMS???

Authors need to be contacted.

MadSpin

Problems with MadSpin. Have been forced to largely drop MadSpin from event generation.

Can that be fixed?

Because of dropping MadSpin, **we had to replace the light H⁺ region from NLO simulation to intermediate LO extended to the light H⁺ mass region.**

Heavy H⁺ gridpack generation

heavy H⁺ gridpack generation (**around 500GeV and above**) works only when **MadSpin is not used**.

We have used then Pythia for the decays. MG5_aMC@NLO has negative event weights. Not an ideal situation. **Is it possible to make a simulation tool for the H⁺ production without negative weights?**

❑ New production channels (above and beyond $gg \rightarrow tbH^+$), eg, AH^+ , hH^+ , etc.

❑ New decay channel, eg, $Wh(SM)$, CB , etc

CMS is working on this channel and a paper is expected this Fall.

How about WZ and W gamma?

CMS explore several other channels such as tb but there is a serious experimental challenge.

❑ New theory paradigms away from MSSM/2HDM.

❑ Stefano:

Experiments are focusing only on certain given channels, and they should extend their searches ??

With the detector upgrade, Stefano encourage the experiments to get out of their comfort zone and look at new channels.

Sami invited Stefano to give a talk for CMS

I assume ATLAS will do the same

- Stefano propose that we continue these efforts and form a community that will meet regularly
- Should we include BSM in general to this efforts?
- Kétévi propose that we need to think carefully and add also other topics without any distraction from
- charged Higgs Searches
- Having a strong working group is the key in ensuring this type of workshop will continue.