

News on HNLs

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LLPX workshop - 10 XI 2021

HNLs and the LLP WG

- Discussion forum tailored to analyses and needs of the LHC, but useful for LLP in general
- We plan to transform HNLs in a LLP WG subgroup:
 - Keep up the regular meetings planned in between LLP workshops (see last slide)
- **Output** of the series of meeting(s) should be a website where we collect a set of tools *[new]*.
 - ***As we have always said please contact us! From last meeting:***
 - **First task** shaped by the input and requests from LHC experiments and interested theorists. We certainly like to hear your opinion & your work
 - We have so far concentrated on trying not to reinvent the wheel every time [...]
 - Perfect place to feature your model that might go unnoticed by large collaborations
 - As we say every time, if interested, get in contact! Your input is very welcome!

HNLs and the LLP WG: future

- The WG home page, including the mandate and convenership, is available:
 - <https://lpsc.web.cern.ch/lhc-llp-wg>
- **Ideally we will have a separate entry dedicated to HNLs something like:**
 - <https://lpsc.web.cern.ch/lhc-llp-wg/hnls>
- In that page we will have two subsections *(to be discussed with the WG conveners)*:
 - One for all the tools that want to be featured in the web page. This page will be a **(t)wiki**:
 - **The twiki should be read-accessible to anyone. Editing should be possible for anyone with a CERN (lite)account who is a member of the associated egroup [1]**
 - One for all the tools that will have passed all three LHC's experiment panel technical examination. In this page the title will underline the fact that these tools are sponsored by the WG. This page will also be a **(t)wiki**.

[1]: <https://simba3.web.cern.ch/simba3/SelfSubscription.aspx?groupName=llp-hnl>

E.g. the Top WG

LHC TOP WG: WG on Top physics at the LHC

To subscribe to the WG mailing list, go to:

<http://simba3.web.cern.ch/simba3/SelfSubscription.aspx?groupName=lhc-toplhwcw>

WG public twiki page:

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCTopWG>

The WG is a forum for:

- the study of the experimental and theoretical systematics in the measurements of top quark properties
- the definition of measurements and tools (MC generators, theory calculations,) required to address the systematics and carry out the physics programme
- the combination of the results of the experiments
- the presentation of the results in a way useful for the theoretical interpretation.

Dedicated subgroups, meeting in closed sessions restricted to the relevant members of the experiments, will discuss the issues related to the comparison and combination of the results including, when relevant, the combination with the Tevatron results.

More details on the WG mandate are given [here](#).

WG documents and meeting agendas: see links in the right menu

Dark Matter WG

EFT WG

Electroweak WG

Forward Physics WG

Heavy Flavour WG

Heavy Ions WG

Long-lived Particles WG

Machine Learning WG

MB & UE WG

Top WG

› WG documents

› WG meetings

› WG plots and twiki

E.g. the Top WG



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TWiki > LHCPhysics Web > LHCTopWG > LHCTopWGSummaryPlots (2021-10-07, MariaAldaya)

LHCTopWG Summary Plots

- ↓ [Standalone Summary Plots](#)
 - ↓ [Pair production cross section](#)
 - ↓ [Pair production differential cross sections](#)
 - ↓ [Single Top Quark Production](#)
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- ↓ [Summary Plots in Publications](#)
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- ↓ [Superseded plots and combinations](#)

Standalone Summary Plots

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Snowmass: White Paper on HNLs

- Commissioned by the Neutrino Physics Frontier group
 - In concert with the EF and RF groups
- A community white paper on the opportunities for future HNL Searches:
 - Overall Editors: I. Shoemaker and A. De Roeck
- Present invited chapter editors
 1. Theory Overview [[Silvia Pascoli](#), [Mikhail Shapohsnikov](#)]
 2. Collider Searches [[Richard Ruiz](#), [ADR](#), [Federico Leo Redi](#),...]
 3. Beta-decay kink searches [[Mike Mooney](#)]
 4. Fixed Target [[Kevin Kelly](#), [Gaia Lanfranchi](#), [ADR](#),...]
 5. Atmospheric and Solar Data [[Ryan Plestid](#), [Ian Shoemaker](#)]
 6. Cosmological bounds [[Alexey Boyarsky](#), [Marco Drewes](#)]
 7. Future Colliders [[Rebeca Suarez](#),...]

Snowmass: summary

- Call to the LLP community to contributing to the HNL Snowmass White Paper. This is a important process for US HEP planning process
- **Contact the chapter editors (or become one) for potential contributions or to be included in the chapter discussion**
- Basically contributions from all activity on HNLs as discussed in our workshops are welcome: either very **recent results** and/or in particular **studies on sensitivities and outlook for future projects/measurements**
 - Question: do we have any studies already on the sensitivity at the HL-LHC with the central detectors?
- Timeline:
 - **First version with most of the text, prelim plots**
 - **Ready by end of February with text and final plots**

Today's meeting

- Very brief meeting:
 - Last time **Philip** presented the new tools for HNLs in pythia: no feedback
 - **He has kindly agreed to present it again today, hopefully some feedback will come**
 - **Marco** has kindly agreed to give us an overlook to what has happened in the theory community since our last meeting:
 - **This is a personal point of view and some contributions might be missed**
- Please tell us what you think should be discussed related to HNLs [here](#)
- You can also share your feedback and thoughts today or in the above document or via email
- **Past meetings:**
 - <https://indico.cern.ch/event/980853/timetable/#b-419715-heavy-neutral-leptons>
 - <https://indico.cern.ch/event/977707/>
 - <https://indico.cern.ch/event/922632/timetable/#b-397427-heavy-neutral-leptons>