HNL Meeting

ADR/CERN

12/10/2020

Ongoing activities

Ongoing/this week:

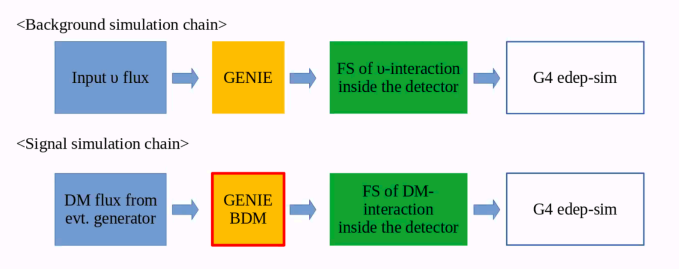
- Preparing the ND simulation (Haifa, Georgios, Athens)
- Preparing the Flux-GENIE chain (Haifa, Georgios)
- Preparing the Flux-Madgraph Chain (Enrique, Josu, et al.)
- Preparing the chain for BNB HNL events (Jose et al.)

And further:

- First study on DUNE-PRISM for HNLs (J. Kopp et al.). I expect we can hear on that next time
- Looking into detector timing?

Master PLAN

- Get the simulation chain in place. So far based on the MPD. Look also at the Argon Cubes? Common BSM study framework?



- Discuss on signal files to be prepared
- Prepare request of background files (neutrino interactions, cosmics) ie which/how many event requested.

-> we need to make progress on this within next 1-2 weeks!

- We have to keep both the TDR and Snowmass White Paper deadlines in mind
  - NB: ADR asked to be a coordinator for the Snomass HNL White paper

NF03 Whitepaper Timeline

- **NF Whitepaper kick off meeting: Nov/Dec. 2020 (?)**
- **2/24 – 2/27/2021: Mid-way check point joint workshop**
  - Good draft sub-topical group whitepapers (=<50pages)
  - Presentations of the status of sub-topical groups and remaining studies with timelines
  - Skeleton draft of NF03 whitepaper
- **3/15 – 3/27/2021: NF workshop**
  - Outline of NF03 whitepaper to be included in the NF summary
    - Must contain key questions and opportunities in BSM@nu
- **4/30/2021**
  - Delivery of the final version of the sub-topical group white papers to NF03 conveners
- **May – June. 2021: Preliminary Frontier Reports and community FB**
- **7/11 – 7/17/2021: Snowmass summer study**
  - Build consensus on key opportunities and priorities
  - Reflect FB and finalize the NF03 Whitepaper (5 – 10 pages)
- **Oct. 2021: Final Snowmass report**

Snowmass2021 - Letter of Interest

Opportunities and signatures of non-minimal Heavy Neutral Leptons

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Abstract: Heavy neutral leptons (HNLs) are one of the most motivated extensions of the Standard Model. Beyond providing a natural explanation to light neutrino masses, these states offer several new portals to dark sectors in non-minimal models. Their "dark" interactions can have important consequences for neutrino masses, the dark matter puzzle, and lead to several experimental signatures yet to be explored. Recently, non-minimal HNLs have been discussed in the context of the MiniBooNE and LSND anomalies as one of the few explanations that is not currently excluded by data. In this letter, we highlight the great discovery potential of such non-minimal HNLs at a variety of experimental facilities, including neutrino detectors, colliders, and kaon experiments.

+ discussions at FIPS 2020 workshop and upcoming summary report