Discussion for DUNE BSM

DUNE BSM Working Group
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Scope of the group

- ## No longer just focused on ND physics

  - Includes phenomena that involves FD as well

- ## Covers all beyond the Standard Model Phenomena

  - Excluding the non-SM topics related to oscillations at the atmospheric Δm^2 scale

  - Covered topics

    - Low-mass DM search

    - Sterile neutrino search

    - Heavy neutrino search

    - Non-Standard Model Neutrino Interactions

    - Others?

NE BSM Group Scope and Timeline
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Timeline

- Studies needed to understand potential enhancement of the detector

- Must be part of CD-2 in FY19

- Complete the initial list of topics and assignments by Jan. 1, 2016
  - Send your favorite topics to Jae (jaehoonyu1@gmail.com)

- What simulation tools are needed?
  - What do we have for what topics?
  - To what level of simulation?
  - Identification of existing tools
  - At what time scale?

Milestones

- Jan. 1, 2016: Complete the initial list of topics and people to work on
  - Identify existing MC tools and the needs for missing tools
- July 1, 2016: Complete initial studies on sensitivities on various topics
  - Assess necessary detector enhancement
- July 1, 2017: Complete more systematic discovery potential and sensitivity studies
- Jan 1, 2018: Take part in CD2 writing

Proposed Organization

- Subdivide the group by the topic of interests
  - LDM
  - Sterile Neutrinos
  - Heavy Neutrinos
  - Non-SM Neutrino Interactions
  - Other Subjects

- Common interest groups for support
  - Simulation Tools
  - Special Reconstruction Software Development

Responsibilities of the subgroup leads

- Continued follow up and promotion of the topic
  - Continued update in the BSM group
- Coordinate close interaction with the relevant experts and theorists for simulation tools and update the simulation tools & software subgroup
- Coordinate the work within the subgroup to
  - Investigate specific detector requirement
  - Generate the discovery potential and/or the sensitivity plots
  - Coordinate writing the relevant CD2 section in a timely fashion

Simulations & Analysis Tools

- Interact with the DUNE simulation and software group

- Interact with BSM subgroups to obtain updates on simulation tools

- Provide necessary integration of simulation tools – including specific theoretical simulators

- Coordinate generation of simulated data necessary for BSM subgroup investigations

- Coordinate development specific analysis software and their integration into the DUNE software package

Sub-group Lead Nominations

- Please suggest the potential members to lead these sub-groups
    - To Jae no later than Friday, Dec. 4
- The subgroup lead will then be decided in consultation with the physics coordination
- The leads will be announced at the next meeting
    - We will have our next meeting in 3 weeks on Tuesday, Dec. 15

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