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
    - Sub-GeV DM search
    - Sterile neutrino search
    - Heavy neutrino search
    - Non-Standard Model Neutrino Interactions
    - Others?

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 (yu@fnal.gov)
- What simulation tools are needed?
  - What do we have for what topics?
  - To what level of simulation?
  - Identification of existing tools
- 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 Neutrino
  - Heavy Neutrino
  - NSM Neutrino Interactions
  - Other Subjects
- Common interest groups for support
  - Simulation Tools Group
  - Special Reconstruction Software Development

Responsibilities of the subgroup leads

- Continued follow up and promotion of the topic
  - Continued update in the BSM group
- Close interaction with the relevant experts and theorists for simulation tools and link the simulation tools group
- Coordinate the work within the subgroup to
  - investigate specific detector requirement
  - Generate the discovery potential and/or the sensitivity plots
  - write the relevant CD2 section in a timely fashion
- The MC Tools group:
  - interact with the DUNE simulation group
  - provide necessary integration of the MC tools – including specific theoretical simulators –
  - coordinate generation of simulated data necessary for BSM subgroup investigations