

Cross cutting topics:

- 1) Design and hardware interfaces
- 2) Simulation and software interfaces
- 3) Physics studies/issues

*Following slides initially prepared by Kendall Mahn,
to be edited as we go*

What are the design/hardware interfaces?

List here, next pages for adding details

- MPD and LAr moving for DUNE PRISM: what do we need to worry about?
 - Moving MPD - *next page for concerns*
 - Moving LArTPC - *next page for concerns*
- Finite hall (span) size set by bore data
 - Is this done independently by each group?
 - Muon efficiency 'gap' - *more in physics next*
- Fringe field MPD vs. 3DST-S, MPD vs LAr
- Interdetector timing and triggering system/design?
- DAQ systems (common across ND? common ND/FD?)
- *Care to add things?*

What are the concerns DUNE PRISM x LAr, MPD?

- Notional movement speed of cm/minute

LAr:

- Pressure requirements, G10 pendulum
 - Bayonet interface on bottom may have some (low) tolerance for movement
 - G10 may be a pendulum//deflection
- Vibration of motion impacting electronics
- Fluid flow?
- Calibration assessment of the detector
- How precise does vertex need to be known? (how well do we need to know alignment of internal components?)
 - monitoring of wall deformations can we use cosmics/rock muons, what are the time scales for variations.
 - (does alignment strategy inform stepwise vs. continuous motion strategy?)
 - how slowly can it move? (beam center known to few cm? does this set a scale?)

MPD:

- (ramp down magnet (30 min timescale) if we go stepwise, avoid quences along lines).
- Vibration of motion impacting electronics and field cage (biggest concern?) services/connections?
 - can operating pressure impact risk of movement

Finite hall size from bore data (everyone)

See Alan's slides from today. Two orthogonal questions:

- Can we reduce the hall size in the beam direction?
 - Reduction of the LAr cryostat?
 - Is there other stuff here we need to discuss/think about?
 - where do the facilities go? (Does DUNE-PRISM impact these facilities and where they go and thus the span)
- Determine minimum DUNE PRISM distance
 - set up dedicated NDDG + LBL discussion to try to understand this.

What are the shared simulation and software tools we need?

- Is there a need for tutorials on any of the current efforts?
 - For LAr, there is some need/benefit for this to spur analysis effort in US
 - CM has large sample of events generated in detector complex
 - (when do we need version control, etc. to benchmark and standardize tools/results)
- Key physics comparison is using LAr + MPD to infer secondary interaction model
 - Does this motivate shared tools along these lines?

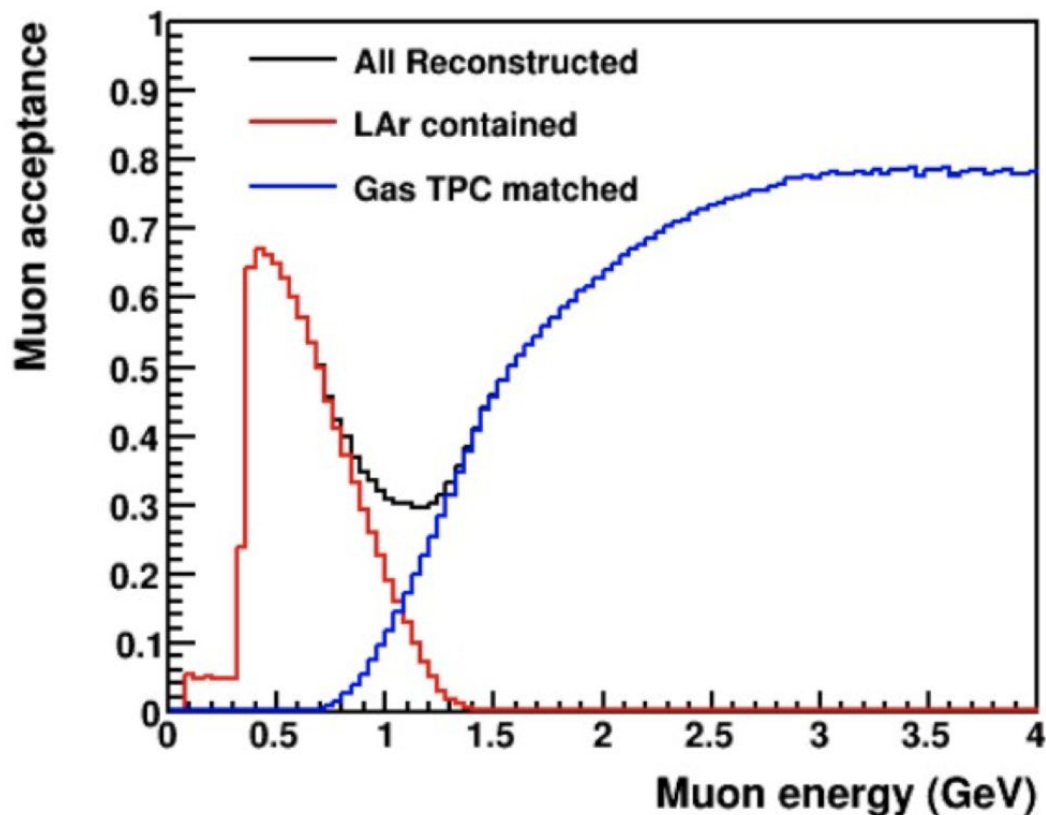
What are the shared design technology effort?

- SiPM for MPD calorimeter, 3DST, LAr light detection?
- Calorimetry for both MPD and 3DST?
- Readout for MPD and 3DST?
- LArPix for both LAr and MPD
- Grounding, power, thermal/cooling (3DST-S has warm magnet)
- Slow control, monitoring and alarms. Alignment?
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What are the shared physics issues?

- What is the impact on LBL of the 'efficiency gap' in LAr + MPD
 - As a function of off-axis angles?
 - additional detection elements?

J. Sinclair, NDDG meeting 4/17/2019



Discussion at dinner:

Gaseous ARgon with Great Other Neutrino detectors

Liquid ARgon with GARGON Offering Nice spectrometry

<https://hiveminer.com/Tags/gargon/>

