DUNE ND-LAr Institute Board

22. March 2021

Topics

- MoU preparation
  - DUNE MoU
  - ND-LAr scope
  - Data collected from PIs
- 2x2 runs
- Reviews, timeline
- Addition of an upstream muon tagger

Additional items of coordination in progress: cryogenics, DAQ

MoUs

- DUNE wide MoUs will define participation in the experiment
- There will be Annexes for consortia, e.g. ND-LAr
  - Template see next slide

The annex for the ND-LAr will define:

- Scope / deliverables
- Which institution provides which item (or funds)
- Which institution contributes to which item

One annex listing all institutions, NOT on an institution-by-institution base

Template MoU

ANNEX n : **The _____ Consortia for the DUNE Near Detector**

This Annex describes the planned design, construction and installation tasks for the _____of the DUNE Near Detector.

Consortia Institutions

Institution	**Principal Investigator**
	Consortia Leader*
	Technical Lead**

*Consortia Leader

** Technical Lead

Scope of the Work

The SoW in this Annex includes the _____ Consortia deliverables for the DUNE Near Detector. The system includes .....

The Task Table below outlines the planned responsibilities and deliverables for the .

Deliverable	Institution(s)	Funding Source
..... System Components		
Blah		
Blah		
..... System Components		
Blah		

Scope

131.02.03.02.01	Module Structure
131.02.03.02.02	HV
131.02.03.02.03	Field Structures
131.02.03.02.04	Charge Readout
131.02.03.02.05	Light Readout
131.02.03.02.06	Calibration
131.02.03.02.07	TPC Module Assembly & Testing
131.02.03.02.08	TPC Installation & Integration
131.02.03.02.09	ND LArTPC Management
131.02.03.02.10	Module Assembly & Test Facility @ FNAL
131.02.03.02.11	Full-scale Demonstrator Test Facility @ SLAC
131.02.03.02.12	2x2 Neutrino Beam Test @ FNAL
131.02.03.02.13	ArgonCube Test Facility @ Bern

Subsystem	Description	Point-of-Contact	Identified resource gaps (for new groups)	Design (Now-2023)	Prototyping (Now-2023)	Procurement (2023-2024)	QA/QC (2023-2025)	Assembly & Testing / Operations (based on item)
Module Structure	the ND LArTPC modules	J. Sinclair						
HV	for the ND LArTPC modules	I. Kreslo						
Field Structures	LArTPC modules	N. Kurita	- Scientific personnel for testing during prototyping / production / assembly					
Charge Readout	the ND LArTPC modules	D. Dwyer	- Scientific personnel for testing during prototyping / production / assembly					
Light Readout	ND LArTPC modules	N. Anfimov	- Scientific personnel for testing during prototyping / production / assembly					
Calibration	ND LArTPC modules	J. Maricic	- Scientific personnel for testing during prototyping / production / assembly					
TPC Module Assembly & Testing	ND LArTPC detector	M. Mooney	- Scientific personnel during TPC Module prototyping / production / assembly - Data analysis of test results, feedback to design/assembly line					
2x2 Prototyping (Now-2022)								
Full-scale Prototyping (2023)								
ND Module Assembly (2024-2026)								
TPC Installation & Integration	detector at the Near Site	J. Asaadi	- Scientific personnel during TPC Module I&I - Data analysis of test results, feedback to installation					
Analysis, Simulation, Reconstruction	the design, prototyping, and eventual operation of the	A. Mastbaum	- Development of ND-LAr simulation - Development of ND-LAr reconstruction - Targeted analyses to inform design and prototyping					
Module Assembly & Test Facility @ FNAL	Modules	L. Suter						
Full-scale Demonstrator Test Facility @ SLAC	Demonstrator ND-LAr TPC Module Prototype	N. Kurita						
2x2 Neutrino Beam Test @ FNAL	ArgonCube 2x2 Demonstrator Neutrino Beam Test	T. Miao	- Scientific personnel for beam test I&I, commissioning, operations - Scientific personnel for Minerva reconfiguration and commissioning - Data analysis of test results, feedback to operations/ND design					
LAr Test Facility @ Bern	individual 2x2 TPC Modules	I. Kreslo						

Overview of collected info (24 replied of 32)

Module structure: 1 institute; OK for procurement, probably need more for QA/QC
HV: 1 institute; OK for procurement, potentially thin for QA/QC
Field structures: 3 institutions, reasonably covered
Charge readout: 9 institutions, reasonably covered
Light readout: 7 institutions, reasonably covered
Calibration: 4 institutions, need more
Module assembly and testing (2x2, FSD, ND): 9 institutions, FTE ?
Integration / Installation: 10 institutions, FTE ?
Analysis: 15 institutions, great !

- Will come back to PIs where there are questions
- Map interests to the detailed scope tables with PIs (group of PIs)

2x2

- Target the start of neutrino beam operation underground at NuMI in October/November 2022 (start of neutrino beam in Fall 2022)
- Proposal: Do a cryogenic and readout test at LArTF in 2021
  - The goal is to prepare an efficient installation at NuMI in 2022, and do a run with at least one module taking cosmic data in 2021
  - 2x2 cryostat will be shipped in April
  - Depending on the outcome of the Module-0 test it can be shipped in Summer
  - Preparations for cryo, slow-control, readout, …
  - Will rely on additional commitments of personnel from Consortium partners in 2021

Reviews / timeline

- April Module-0 run in Bern
- May 2021 internal detector systems review “readiness for PDR/TDR”
- PDR/TDR in calendar Q4/2021
- 2x2 cryo and NuMI runs 21-22-23
- FDR in calendar ~ Q2/3 2023
- Full size demonstrator ~2023
- CD-3
- PRR in calendar ~ Q1 2024

Addition of an upstream muon tagger

- See Chris' talk at the ND-LAr meeting last Thursday
- Proposal to add scope to the consortium
- Need to be discussed here