First Organizational Steps for DUNE Photon Detector Consortium

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DUNE Single-Phase Photon Detector Consortium Meeting

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Organizational Structures/Meetings

- Working groups
  - There are 5 Working Groups (WGs)
  - Membership in WGs will be self-selected from consortium members
    - Working group leaders are being selected
    - Please look for contact information for joining consortium working groups via e-mail this week
  - Working groups will initially meet on a bi-weekly basis
    - Meetings will be called by technical coordinator group initially
    - Doodle polls coming soon!

Photon Detector WBS

- The main organizational backbone for the PD consortium will be the WBS
  - Budgets and schedules will be coordinated within WBS structure
- Organized by deliverables along working group structure
- Maintained by technical coordination team
- Working group leaders will be responsible for their WBS sections
  - Should be modified within the basic structure by working groups to reflect project needs
- WBS will be posted online in Excel format soon!
- We need to begin filling in provisional responsibilities ASAP!

Light Collector

WBS	Description	Responsible Institutions
1	Production Photon Detector	
1.1	Light Collector	
1.1.1	IU-Style Bars	
1.1.1.1	Conceptual Design	
1.1.1.2	Engineering Design	
1.1.1.3	Materials Selection	
1.1.1.4	Prototyping	
1.1.2	FNAL-Style Bars	
1.1.2.1	Conceptual Design	
1.1.2.2	Engineering Design	
1.1.2.3	Materials Selection	
1.1.2.4	Prototyping	
1.1.3	ARAPUCA	
1.1.3.1	Conceptual Design	
1.1.3.2	Engineering Design	
1.1.3.3	Materials Selection	
1.1.3.4	Prototyping	
1.1.4	Production Fabrication	
1.1.5	Test Stand Development	
1.1.6	Testing	
1.1.7	Production Shipping	

Photo Sensors

WBS	Description	Responsible Institutions
1	Production Photon Detector	
1.2	**Photo Sensors**	
1.2.1	Evaluation, Qualification, and Selection	
1.2.2	Development of Packaging	
1.2.3	Development of Array & Ganging Configuration	
1.2.4	Cold Board Design	
1.2.5	SiPM Procurement	
1.2.6	Cold Board Fabrication	
1.2.7	Cold Board Assembly	
1.2.8	Test Stand Development	
1.2.9	Testing	

Electronics/Cables/Calibration/ Monitoring (1 of 2)

WBS	Description	Responsible Institutions
1	Production Photon Detector	
1.3	Electronics/Cables/Calibration	
1.3.1	Read-Out Modules	
1.3.1.1	Design	
1.3.1.2	Fabrication	
1.3.1.3	Test Stand Design	
1.3.1.4	Testing	
1.3.1.5	Firmware programming	
1.3.2	Cables	
1.3.2.1	Cold Signal Cables	
1.3.2.1.1	Selection/Validation	
1.3.2.1.2	Fabrication/Procurement	
1.3.2.1.3	Test Stand Design	
1.3.2.1.4	Testing	
1.3.2.2	Cold Bias-Voltage Cables	
1.3.2.2.1	Selection/Validation	
1.3.2.2.2	Fabrication/Procurement	
1.3.2.2.3	Test Stand Design	
1.3.2.2.4	Testing	

Electronics/Cables/Calibration/ Monitoring (2 of 2)

WBS	Description	Responsible Institutions
1.3.2.3	Warm Low-Voltage Cables	
1.3.2.3.1	Selection/Validation	
1.3.2.3.2	Fabrication/Procurement	
1.3.2.3.3	Test Stand Design	
1.3.2.3.4	Testing	
1.3.2.4	Warm Bias-Voltage Cables	
1.3.2.4.1	Selection/Validation	
1.3.2.4.2	Fabrication/Procurement	
1.3.2.4.3	Test Stand Design	
1.3.2.4.4	Testing	
1.3.3	Low-Voltage Power Supplies	
1.3.3.1	Selection/Validation	
1.3.3.2	Procurement	
1.3.3.3	Testing	
1.3.4	Bias-Voltage Supplies	
1.3.4.1	Selection/Validation	
1.3.4.2	Procurement	
1.3.4.3	Testing	
1.3.5	PDS Monitoning/Calibration System	
1.3.5.1	Conceptual Design	
1.3.5.2	Engineering Design	
1.3.5.3	Materials Selection	
1.3.5.4	Prototyping	
1.3.5.5	Fabrication	
1.3.5.6	Test Stand Development	
1.3.5.7	Testing	

Software & Physics

WBS	Description	Responsible Institutions
1	Production Photon Detector	
1.4	**Software and Physics**	
1.4.1	Software Deliverables	
1.4.1.1	Simulation Code	
1.4.1.1.1	Implement PDS Geometry	
1.4.1.1.2	Validate Material Optical Properties	
1.4.1.1.3	Simulation of light formation in liquid argon (full)	
1.4.1.1.4	Simulation of light formation in liquid argon (fast)	
1.4.1.1.5	Simulation of Detector Response	
1.4.1.1.6	Validate light simulation with experimental data	
1.4.1.2	Reconstruction Code	
1.4.1.2.1	PDS Event timing reconstruction algorithms	
1.4.1.2.2	PDS Event position reconstruction algorithms	
1.4.1.2.3	PDS Event energy reconstruction algorithms	
1.4.1.3	Calibration	
1.4.1.3.1	Run Control Software	
1.4.1.3.2	Analysis Software	
1.4.1.3.3	Calibration Database	
1.4.1.4	Hardware Database	
1.4.1.4.1	QC Documentation	
1.4.1.4.2	Component Tracking	
1.4.1.5	Data Collection	
1.4.1.5.1	Hardware Initialization/Configuration Code	
1.4.1.5.2	Hardware Monitoring Code	
1.4.1.6	Data Monitoring Code	
1.4.1.7	Slow Control	
1.4.2	Physics Deliverables	
1.4.2.1	Further development of PDS subsystem requirements	
1.4.2.2	Validation of PDS Requirements with respect to Physics Performance	
1.4.2.3	PDS Performance Validation via ProtoDUNE Data Analysis	
1.4.2.4	Demonstrate PDS radiological/cosmogenic background rejection capabilities	
1.4.2.5	Develop strategies for using PDS information to trigger on interesting events	
1.4.2.6	Develop strategies for online reduction of PDS data volume.	
1.4.2.7	Study potential light-enhancement strategies involving reflective cathode planes	
1.4.2.8	Editing of TDR chapter	

Integration

WBS	Description	Responsible Institutions
1	Production Photon Detector	
1.5	**Integration**	
1.5.1	System Engineering	
1.5.1.1	Internal Interface Specifications (within PDS subsystem)	
1.5.1.2	External Interface Specifications (with other subsystems)	
1.5.1.3	Development of QA Plan (specification of tests/facilities)	
1.5.1.3.1	Material Selection/Characterization	
1.5.1.3.2	Aging tests for material coatings	
1.5.1.3.3	Aging tests for SiPMs	
1.5.1.3.4	Material suitability for LAr contamination certification	
1.5.1.4	Development of QC Plans (for all components)	
1.5.2	PD Pre-Installation Testing/Installation/Integration	
1.5.2.1	PDS Pre-installation Test Facility	
1.5.2.1.1	Design	
1.5.2.1.2	Fabrication	
1.5.2.1.3	Operation of test facility	
1.5.2.3	Installation & Commissioning of PDS Components	
1.5.2.3.1	Develop Installation Plan	
1.5.2.3.2	Install photon detectors/cables on APAs (Integration Facility?)	
1.5.2.3.3	Test photon detectors/cables on APAs (Integration Facility?)	
1.5.2.4	Initial Operation/qualification of PD system	
1.5.2.5	Analysis of PDS Performance	
1.5.2.6	PDS Electronics Infrastructure	
1.5.2.6.1	Develop Cable Routing Plan	
1.5.2.6.2	Design Cable Support Structures	
1.5.2.6.3	Fabricate Cable Support Structures	
1.5.2.7	b. Cryostat Flanges	
1.5.2.7.1	Develop Cable Routing Plan	
1.5.2.7.2	Design Flange and Cable Support Structures	
1.5.2.7.3	Procure/Fabricate Flange and Cable Support Structures	
1.5.2.7.4	Develop Plan for connecting cables to feed-throughs	
1.5.2.7.5	Connect cryostat flange cables	
1.5.2.8	Collaboration with HV System consortium on potential light-enhancement strategies involving reflective cathode planes	

WBS Deliverables

- 14 September: we need to produce a first draft of the WBS structure => Ongoing
- 28 September: refine the WBS and discussion on missing and overlapping scope in WBS. First draft of activities for 2018/2019 beyond protoDUNE => WG should have a major role in this

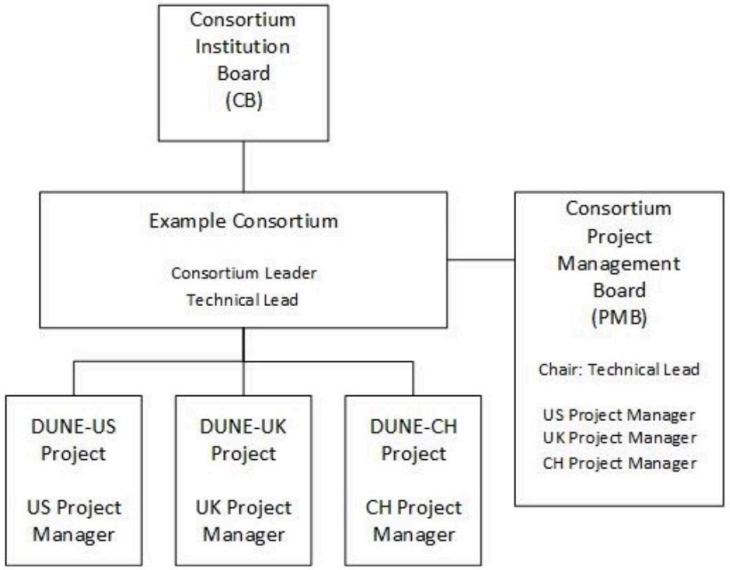
- 12 October: First draft of Institutional responsibilities for each WBS element

- 26 October: Finalize WBS and Institutional mapping to be presented at the RRB meeting of November 2nd

Consortium Project Management Board

- Project Management Board (PD PMB) will be created once initial PD responsibilities are understood under WBS structure
- The Project Management Board will be important for understanding the fiscal model for the PD and division of responsibilities.
- Look for more information about the PD PMB in coming weeks!

Consortia Management



From Eric James Presentation