

# DUNE Physics TDR

Albert De Roeck

CERN

# Physics Volume of the TDR: Getting underway

- **Physics Volume Editors:**

Albert De Roeck

Jon Urheim



Slides from  
Ryan Patterson  
last DUNE week

- **Working closely with Physics Coordinators** to define initial scope, timeline, and milestones for production of the Physics Volume
- **Boundaries between Physics Volume and Detector Volume(s)** will require broader coordination. *Examples:*
  - Where is the electronics simulation described? Is that Physics or part of the CE Consortium's scope?
  - A plot of " $E$  resolution vs.  $E$ " feels like physics. What about a plot of " $E$  resolution vs. voltage"?

# Physics Volume of the TDR: Getting underway

- As we move to the consortium structure, **calibration responsibilities** become spread out.
  - Some lie within the Physics groups, and discussions are underway to better define these. *But...*
  - Still strongly coupled to FD Consortia responsibilities  
(*e.g., PDS calibration could be entirely owned by PDS Consortium. What about electron lifetime via muons? Energy scale via muons? Many of these span multiple Consortia in principle. Our subsystems don't factor as cleanly as, say, ATLAS's.*)
- **Physics Volume needs to support both SP and DP detectors.**
  - Milestones (*next pages*) apply to both.
  - In bulk text, can show full gory details for SP and show critical comparisons for DP (*lest the document become unreadable with all the back-n-forth.*)
  - Internally, though, require same level of studies for both!

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- Must stay nimble mid-2018 as the landscape could evolve at the **Neutrino 2018 conference**. Messaging may change.
  - Volume will include introductory “physics context” sections for broad audience.
- The next two slides show an approximate Physics Volume timeline.
  - Will **finalize timeline and bulk scope over the next month**, prior to the LBNC meeting (June 22–24)
  - Feedback can begin today. Will engage more with the WGs in coming weeks.

# TDR Physics Volume: Timeline and Milestones (DRAFT)

**June 2017**

High-level outline, scope, and milestones defined.  
Document workflow established.

*Discuss/iterate with WGs to finalize high-level picture, then...  
WGs begin preparing detailed outlines and defining key plots/tables.*

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**Aug 2017 (collab mtg)**

WGs present detailed outlines.

Iteration and adjustments likely, esp. at boundaries.

*For key plots/tables:*

- What technical steps are still needed to make each?
  - **Planned delivery date for proof-of-principle** for each?  
*[Should be Jan 2018 or May 2018 in most cases]*
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**Sept 2017**

LArSoft integration complete wherever applicable

*[A major milestone. Performance will evolve, but all key interfaces should be in place.]*

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**Jan 2018 (collab mtg)**

Demonstrate “Jan 2018” proofs-of-principles

**May 2018 (collab mtg)** Demonstrate “May 2018” proofs-of-principles

Also, **checkpoint/review of all high-level scientific goals.**

*For each:*

Achieved? Clear path by Jan 2019?

Alternative strategies required?

*Text writing starts ramping up*

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**Sept 2018 (collab mtg)** **Supplemental internal documentation** ready for review  
*(Requirements TBD. The idea is to give the collaboration enough detail on each analysis to properly vet the results.)*

*Text writing well underway*

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**Jan 2019 (collab mtg)** **Analyses frozen.** Final plots and numbers assembled.

**Feb 2019** Begin **internal review** of complete draft

**April 2019** **Final version** ready for external review`

# Next Steps

- Structure basically in place, to be discussed with the physics group leaders
- Follow to a large extent the CDR (with some regrouping)
- A chapter (and perhaps appendices) on the tools is foreseen. Details to be worked out with the working groups
- DP: recommend to focus in those channels that stress the strength of the DP-technology