

The Technical Design Report (TDR) for SAND in the ND complex

Paolo Bernardini, Luca Stanco

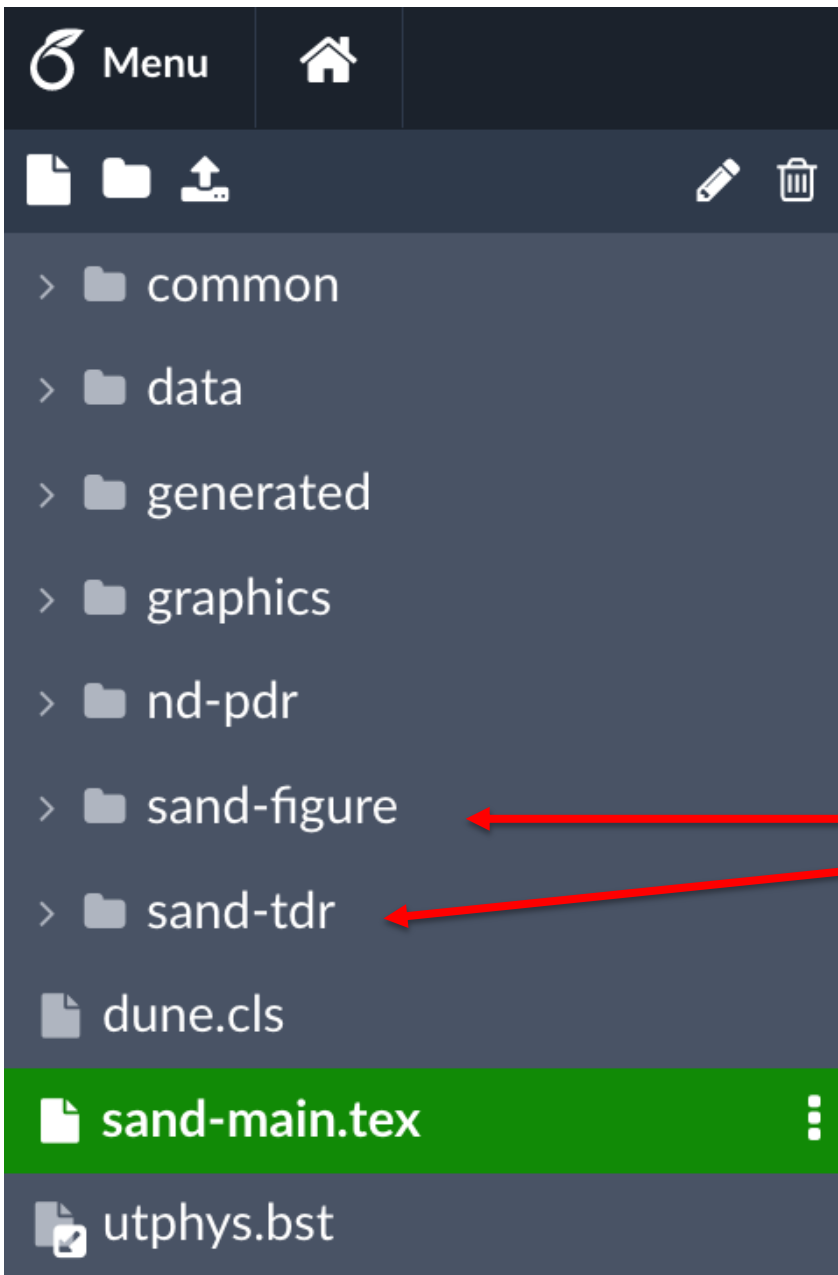
ND-SAND KLOE Components PDR

July 22, 2024



UNIVERSITÀ
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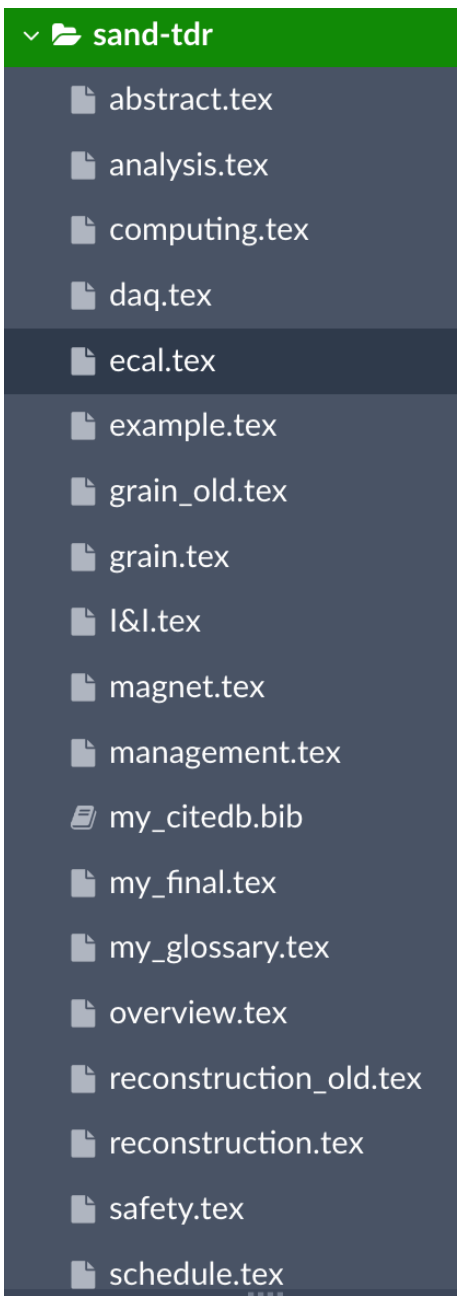




An overleaf is adopted according to
LATEX conventions for LBNF/DUNE documents
(shared with H.A. Tanaka and A.E. Heavey)

The figures in **sand-figure** and the files in **sand-tdr**
are input for **sand-main.tex**

Very simple to transfer text and figures
in the general ND-TDR



Sections in the SAND chapter

- 1. Overview (requirements & opportunities)
- 2. Lead/Scintillating-Fiber Calorimeter (ECAL) } draft for PDR
- 3. Superconducting Magnet
- 4. Liquid Argon Active Target (GRAIN)
- 5. Tracker
- 6. Data Acquisition (DAQ) Architecture
- 7. Detector Control (DCS)
- 8. Detector Safety System (DSS)
- 9. Software & Computing
- 10. Event Reconstruction
- 11. Analysis
- 12. Installation & Integration
- 13. Safety
- 14. Organization & Management
- 15. Time Schedule
- 16. Possible Upgrades

glossary.tex ← New DUNE words and new references in evidence (at the file end)
citedb.bib ←

Sections in the SAND chapter

1. Overview
2. Lead/Scintillating-Fiber Calorimeter (ECAL)
3. Superconducting Magnet
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16. Possible Upgrades

Plan

1. At least 2 authors for each section *done*
2. Index & key words for each section *done*
3. Data collection & write-up *in progress*
4. Internal reading & correction *started for PDR*

Present number of pages 238

ECAL & Magnet sections

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1.1 OVERVIEW **pages 1-6**

Update in progress according to the TASK-FORCE document
(approved in last DUNE general meeting)

1.2 CALORIMETER **pages 7-72**

Draft available for PDR

1.3 MAGNET **pages 73-97**

Draft available for PDR

1.4 GRAIN

pages 98-113

Present text and figures about

- matrix description
- lens description
- mechanics
- ASIC design

To be completed

- reconstruction

To be written

- simulation & results
- integration & installation
- schedule & milestones

*Deadline in the
Working Group
End of July*

1.5 TRACKER

pages 114-117

Present - some figures about STT geometry

1.6 DAQ

1.7 DCS

1.8 DSS

pages 118-125

Ready draft - DSS

To be completed - DAQ
- DCS

Present

- GEANT & FLUKA
- single particle reconstruction (muon, neutron ...)
- particle ID

To be written

- reconstruction with GRAIN
- event separation in the spill

From the document
DUNE-doc-13262-v7
"A Proposal to Enhance
the DUNE Near-Detector
Complex"

Present

- selection of CC interactions
- ν - H interactions
- flux measurement
- ν - e scattering
- coherent π production
- ν_e/ν_μ ratio

To be written

- external background
- on-axis beam monitoring

From the document
DUNE-doc-13262-v7
"A Proposal to Enhance
the DUNE Near-Detector
Complex"

To be written

| | |
|-------------|--------------------------|
| 1.9 | Computing |
| 1.12 | I & I |
| 1.13 | Safety |
| 1.14 | Management |
| 1.15 | Time Schedule |
| 1.16 | Possible Upgrades |

To be developed in connection with the other ND-detectors

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Confident to be ready
for the next reviews