

- Use Sharelatex, access by invitation (ask if you want to be invited)
- Figures in .eps .png .pdf organised in same sections as for text
- bibliography in bibtex

The screenshot displays a LaTeX editor interface. On the left, a file explorer shows a project structure with folders for 'Figures' and 'Sections', and various text files including 'Introduction.tex'. The main editor window shows the source code for the 'INTRODUCTION' section, starting with a comment and followed by several paragraphs of text describing the DUNE experiment and the LAr TPC detector technology. On the right, a preview window shows the rendered PDF output, featuring the title 'A 5 ton demonstrator for large-scale dual phase liquid argon time projection chambers', an abstract, keywords, and a detailed table of contents.

Source Code Snippet:

```

1 % INTRODUCTION - \label{sec_intro}
2 Liquid argon time projection chamber (LAr TPC) is the detector
  technology chosen for the DUNE (Deep Underground Neutrino Experiment)
  experiment \cite{Acciarri:2016oee}. DUNE is the next generation of
  underground experiments aiming to study neutrino properties from both
  man-made and natural sources as well as probe the grand unification
  energy scale via nucleon decay searches. Such varied program requires a
  massive detector with active volume on a multi-kt scale. Numerous R&D
  efforts throughout the world have been aimed at realizing this goal. In
  Europe, a solution has been developed within the LAGUNA-LBNO design
  study for a LAr TPC detector with a mass of 20 kt to 50 kt
  \cite{lagunalbno:par1}. The detector concept relies on the
  amplification of ionisation charges in ultra-pure cold argon vapour
  layer above the liquid to realize low-energy detection thresholds with
  high signal-to-noise (S/N) ratio over a long drift distances in a large
  fully-active volume.
3
4 The principle of operation of the LAr TPC relies on the detection of
  ionisation electrons --- produced in the liquid argon by charged
  particles traversing the medium --- on sets of electrodes that provide
  the two-dimensional localisation of the point where the energy
  deposition had occurred. The time it takes for the charge cloud to
  arrive at the electrodes under influence of an electric (drift) field
  inside active TPC volume gives the third spatial coordinate along the
  axis parallel to the drift direction. In addition to charge, ionising
  particles produce excited excimer states of Ar that decay by emitting
  photons in ultraviolet range (128 nm). This light, recorded with a
  suitable cryogenic photon-detection system, provides an absolute time
  reference for the event with respect to a global clock cycle and could
  be used to trigger charge readout electronics.
5
6 Traditionally the ionisation charge in LAr TPC has been detected inside
  liquid volume using a set of wire planes (views). Typically three views
  are used with the first two (in the sense encountered by the drifting
  electrons) detecting electrons by induction while the third and the
  last one collects the charges. In the case of the LAr TPC with
  dual-phase charge readout (DLAr TPC), the ionisation electrons are
  drifted upwards to the gas-liquid boundary and then extracted into
  gaseous phase with a help of submerged grid of wires that provide a
  local field of  $\sim 2$  kV/cm. Once in the gas, electrons are multiplied
  in Townsend avalanches taking place in the holes of a 1 mm thick GEM or
  LEM (Large Electron Amplifier) \cite{Bondar:2008yw}. The resultant
  charge is collected on an anode with a two-dimensional segmentation
  providing two orthogonal detection views. The structure of the
  extraction grid, LEM, and anode will collectively be referred to as
  Charge Readout Plane (CRP) in the rest of the paper.
7
8 The amplification of charge (or gain) in the dual-phase readout scheme
  allows to cope with a weakening of the signal strength due to electron
  attachment to electronegative impurities in liquid Argon and diffusion
  effects thereby making it possible to build large detector volumes with
  long drift distances. The gain factor could be tuned by adjusting the
  electric field strength in the LEM to achieve a good S/N ratio with a
  
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Rendered PDF Preview:

A 5 ton demonstrator for large-scale dual phase liquid argon time projection chambers

Abstract

Keywords: Neutrino, liquid argon TPC

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1. Introduction (Federico)

2. Overview of the setup (Federico)

3. Cryostat and cryogenic system: overview and performance (Sebastien)

- >Cryostat
- >Cryogenic and argon purification system
 - piston purge and gas recirculation
 - could down and filling
 - boil off compensation and purification during operation

4. TPC description (Slavic & Eddy & Federico)

- >Drift cage (includes VHV FT)
- >Charge Readout Plane (Slavic & Eddy)
 - Mechanical frame & suspension system Large Area LEMs & Anode LEM biasing (medium voltage FT)
- >Photon detection system (Federico)
 - PMTs (coating, bases, single wire bias)
 - DAQ

5. Charge Readout scheme & data processing (Slavic)

- >Cold analog FE and signal FT
 - accessible cold FE cards (describe SGFT card insertion, operation, measured temperature @ FE, etc..)
 - FE cards and ASIC characteristics (expected ENC, calibration, sensitivity)
 - anode charge injection system
- >Digital back end and data acquisition

6. Ancillary instrumentation & slow control (Mario, Sebastien)

- >Cryogenic cameras
- >temperature measurements
- >level monitoring
- >Slow control back end

7 Dector commissioning and first data (Sebastien, Federico) (Laura M, Laura MB)

- >Stability of liquid level and charge readout plane adjustment
- >HV and VHV system settings and stability
- >Charge readout performance and response
 - Electronic noise study
 - Response to an injected pulse (3m vs 1 m strip, impedance, pulsing , signal shape etc..)
- >First data
 - electroluminescence & evidence for charge extraction
 - observation of first cosmic muons with gain

- First attempt at sections, will evolve as we write. Please comment and tell us if you want to add something or parts are missing.
- Describe the detector and show first performance in section 7 (nice track(s), light signal, HV-configuration,..)
- proposed list of main section responsible. Each section editor can decide how he/she wants to organise the writing and assignments for subsections. Expect participation from the entire collaboration. Next Friday will update this list with the names per sub-section
- Aim for first draft end of December (22nd) and submission at the end of January.