

C. Vallée
LCTPC meeting, DESY, 10 January 2019



TPC EXPECTED CONTRIBUTIONS TO IDR

IDR TECHNICAL CHAPTERS

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TPC

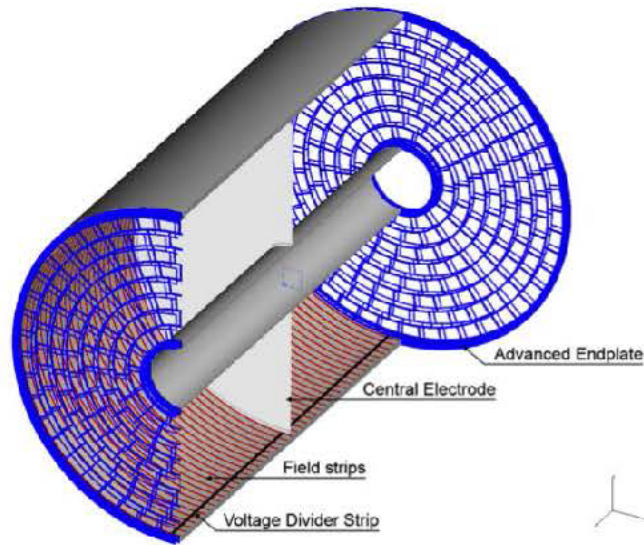
NEEDED

INPUTS

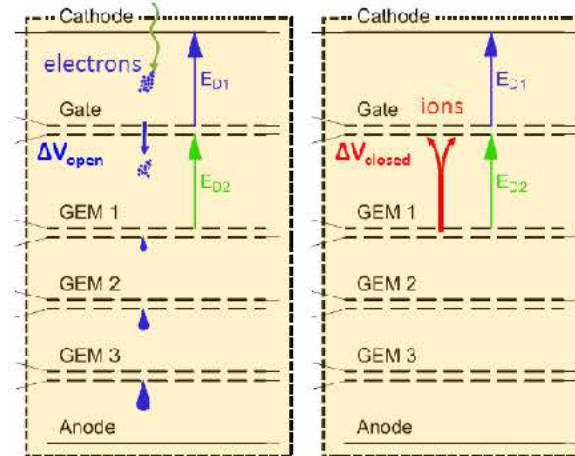
DETECTOR LAYOUT

Plots to be updated with latest versions

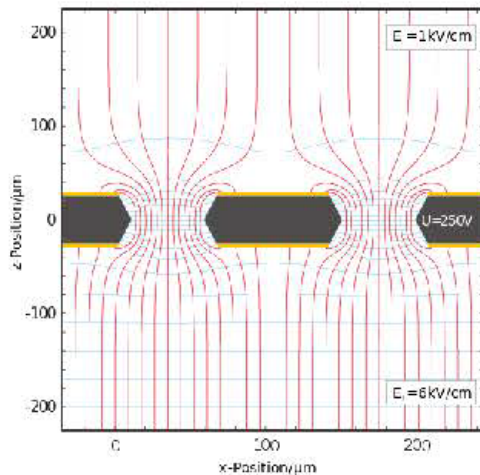
TPC layout



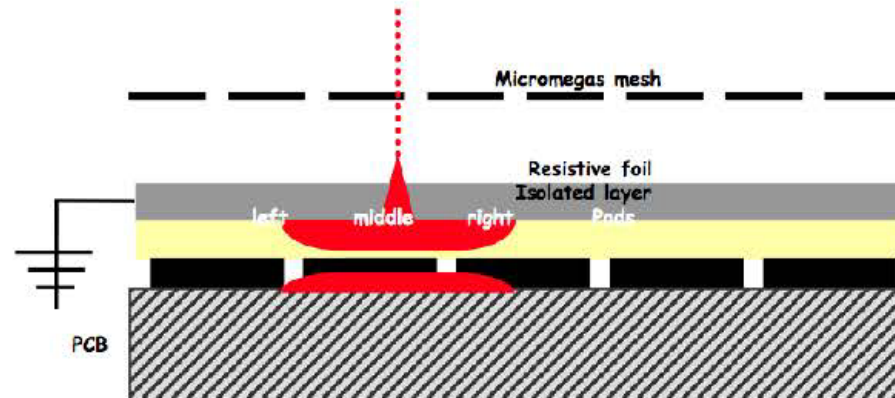
TPC gating



TPC readout options: GEM



Micromegas

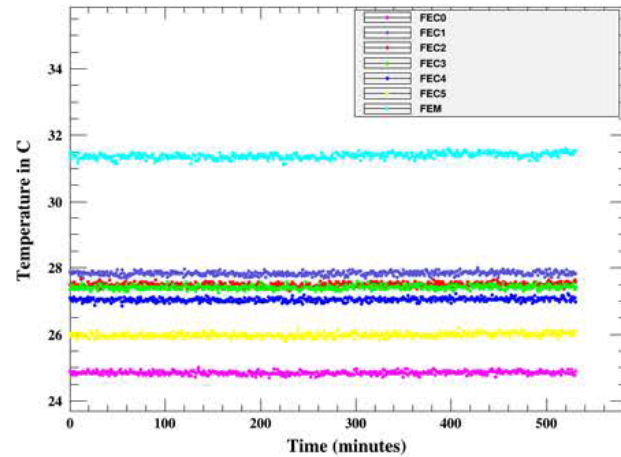


4.2.3. TPC (~3 pages of plain text)

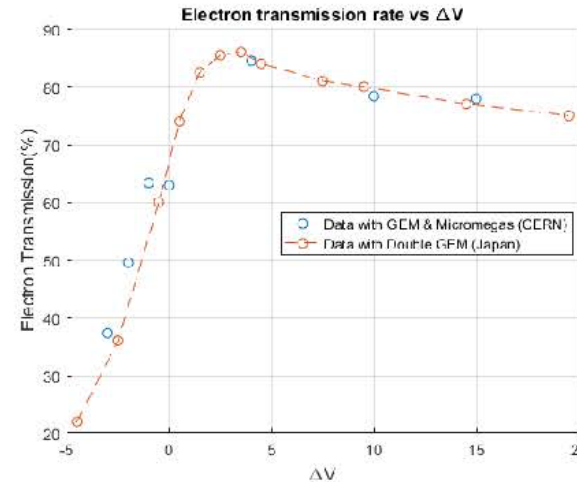
TECHNOLOGY STATUS

TPC prototype for generic beam tests of all readout options, the gating scheme and cooling. Mention AIDA silicon telescope and new field cage in construction.

CO2 Cooling measurements



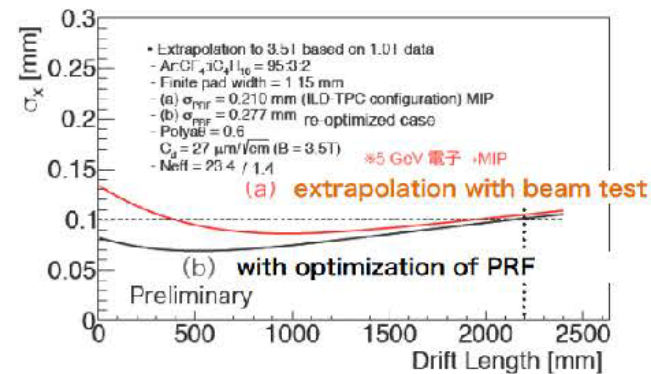
Successful gating achieved with GEM



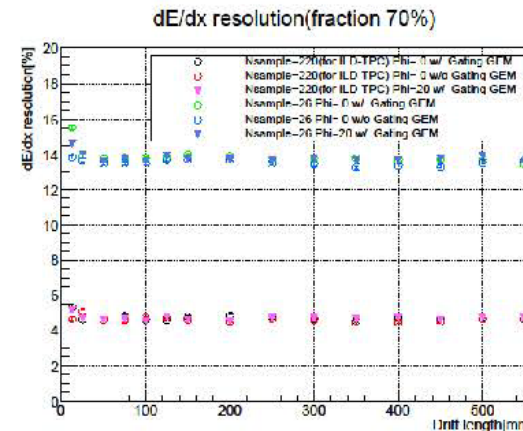
Performance plots to be updated with latest results

Achieved resolutions:

100 μ spatial



5% dE/dx



4.2.3. TPC (~3 pages of plain text)

TECHNOLOGY STATUS cont'd

Latest photo of TPC testbed to be provided

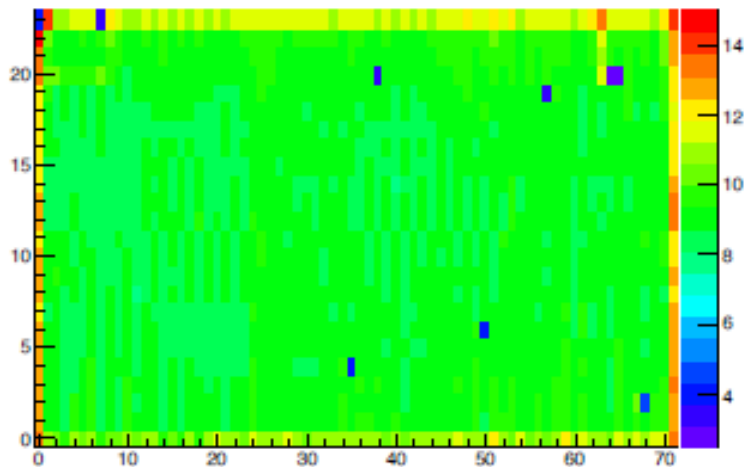


New field cage for TPC testbed

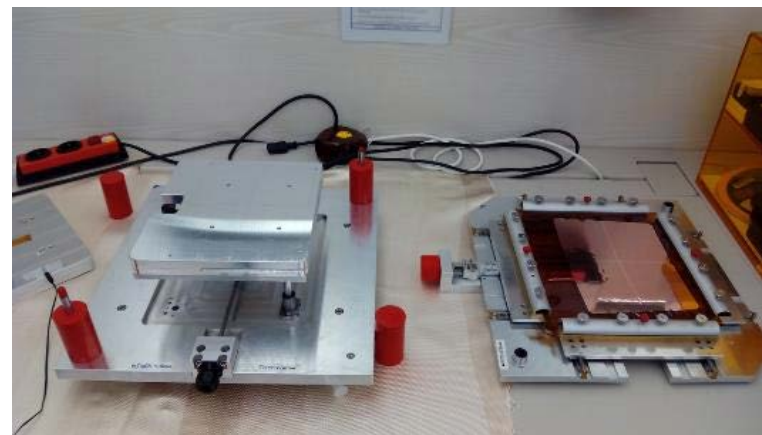


Improved micromegas modules for November beamtest at DESY

P



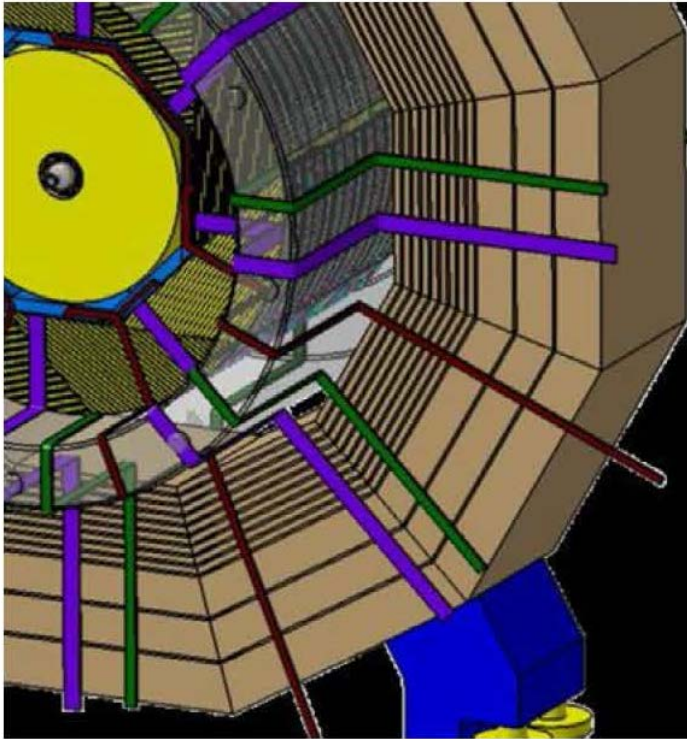
New GEM modules with improved flatness



R&D on pixel readout (QUAD module)

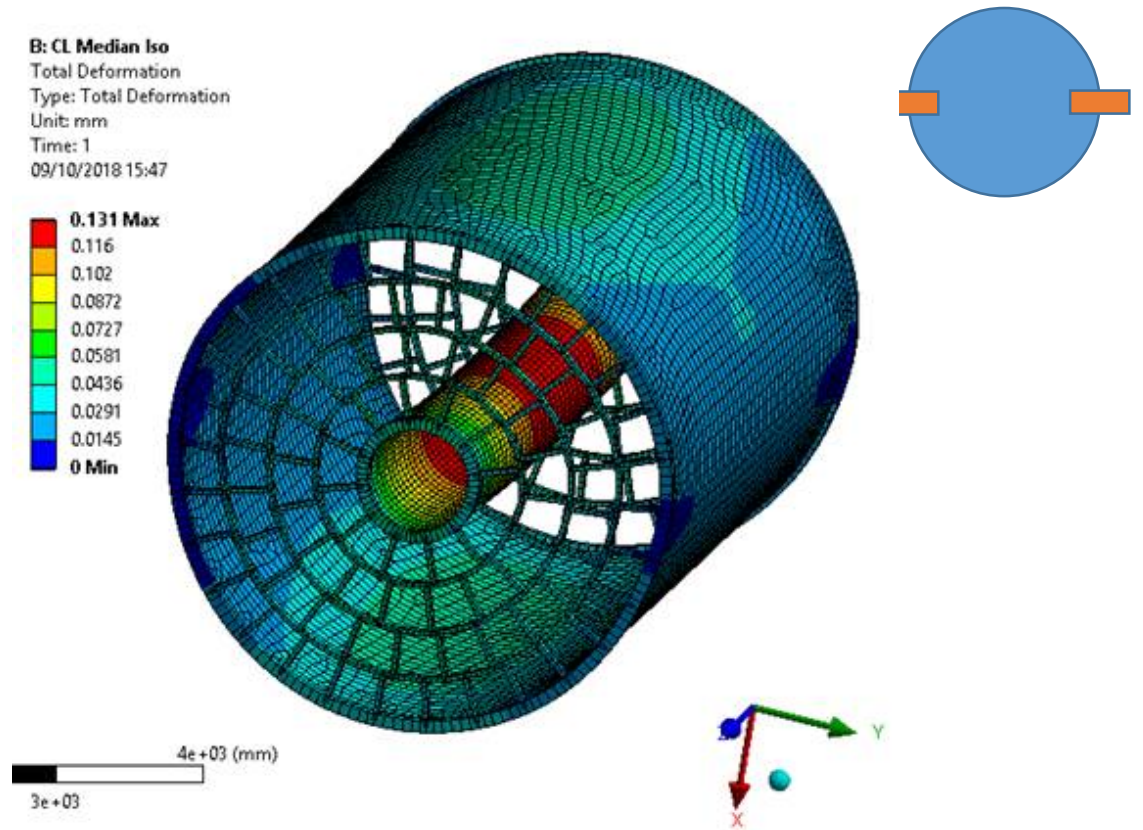


INTEGRATION: CABLING



Cable paths to be given
to Roman et al (ICD document)

INTEGRATION: MECHANICS



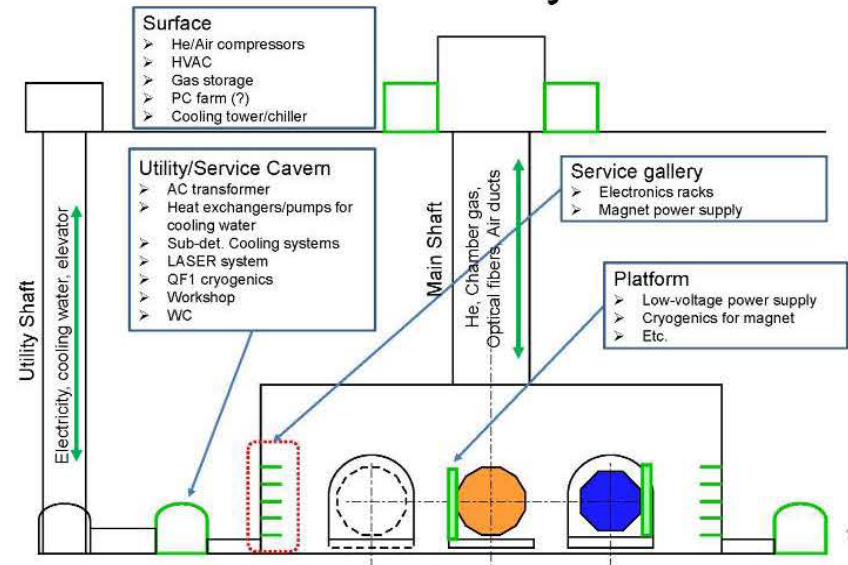
Work started on
TPC supports and rigidity
to be documented

EXTERNAL INTEGRATION: CAVERN UTILITIES

5.2

Proposed main editor: Yasuhiro Sugimoto
 (~1 page of plain text)

Generic layout of the cavern,
 mentioning the current options for its
 configuration (TDR, Tohoku, YS...).



5.2.1. Cavern ancillary services

Proposed main editor: Yasuhiro Sugimoto
 (~3 pages of plain text)

Summary of ancillary services from
 subdetectors in the cavern and on surface,
 as it will result from subdetector
 information to be provided in
 Yasuhiro's excel file.

ILD overall wish for utility space
 on the platform, the service gallery
 and the service cavern.

9/5/2019		AH GAL
Sub-detector name		
Number of 19-inch electronics racks	Platform Service gallery Utility/Service Cavern (USC)	
Sub-detector cooling system	Floor in USC WxDxH	m ³
Gas system	Space on surface (WxD)	m ²
	Space in USC (WxD)	m ²
	Space on service gallery (WxD)	m ²
	Space on platform (WxD)	m ²
Laser system	Space in USC (WxD)	m ²
<p>Updated excel file for space requests in cavern to be filled</p>		

5.2.2. Data Acquisition

ILD INTEGRATION: DATA ACQUISITION

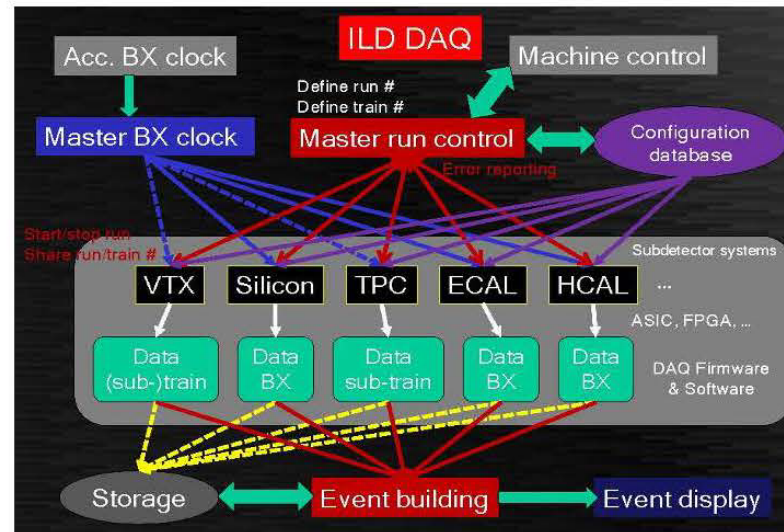
Proposed main editors:

Matthew Wing and Taikan Suehara

(~2 pages of plain text)

Expected principles and sketch of the DAQ.

Summary of characteristics of subdetector data including data throughput and local filtering, based on DAQ information recently requested to all subdetectors.



Answer list of questions sent to subdetectors on their data structure and content using the latest beam BG simulations from Daniel Jeans

Within this framework it would be good to summarize the expected characteristics of your bunch train data packages:

- sensors readout structure (per BX? continuous? per train? ...)
- average raw data size per BX, event or train.
- estimate of the % of raw data due to physics events, beam background, electronic noise.
- expected online subdetector data processing (upstream of central DAQ) on your bunch train package including zero-suppression, calibration, etc..., and where it is expected to be performed (frontend/backend). Here several options may be considered including e.g. partial event building of inner trackers if it helps for early tracklet reconstruction and noise suppression.
- average data rate after subdetector data filtering, as input to central DAQ.
- if already defined, expected physical support of the data transfers including type and number of cables/fibers.

Note that this information is mainly intended to better understand the intrinsic characteristics of the ILD data flow.

C. Vallé The technical implementation of the filtering steps may still evolve strongly until the actual installation of ILD.

COSTING

TPC WBS tables to be updated within costing group

8.1. WBS TABLES

Simplified tables from subdetectors updated using latest info from technological prototypes and spinoffs. WBS tables are expected to be collected from subdetectors until summer.

	Steps/Needs	Quantities	Unit	Tools	Place	Unit cost/time	Cost in k€	M.Y	fraction
2.	Electromagnetic calorimeter						158159.14	115.8	
2.1	Barrel	1					105552.807	77.1	65.7%
2.1.1	Module structure construction	40					14461.54	51.1	13.7%
2.1.1.1	Material procurements and operations						12209.04	5	
	Tungsten plates (thickness tolerance +40 µm) Thickness : 1.05 – 2.1 – 4.2 mm	90.3	ton		Industry Several suppliers	120	10838		
	Dimensional inspection of W plates	24000	plates	3D measurement system	HKMC/industry			5	?? Not a procurement
	Carbon fibres prepreg 3K for H structure	6000	m ²		Industry	0.09	540		
	Carbon fibres prepreg 3K for a veolar structure	13000	m ²		Industry	0.05	650		
	Thin carbon plate (2mm) with 12K fibres	40	plates		Industry	1	40		
	Thick carbon plate (15mm) with 12K fibres	40	plates		Industry	2	80		
	Pauls fabrication (male + female parts)	80	parts		Industry	0.5	40		
	Metal inserts	950	inserts		Industry	0.024	23.04		
2.1.1.2	Monolayer alveolar structure	600					1812	15	
	Tools procurements						342	0	
	Hexocl moulds	6	moulds		Industry	50	300		
	Steel ground cores	30	cores		Industry	1	30		
	Storage boxes	40	boxes	Specific boxes	Industry	0.300	12		
	Operations						1470	15	
	Dimensional inspections (cores & moulds)	all		3D measurement system	Industry				
	Weighing operations	all	inserts	Clear man	Industry	2 days	1000	10	