

ILD meeting
3 April 2018

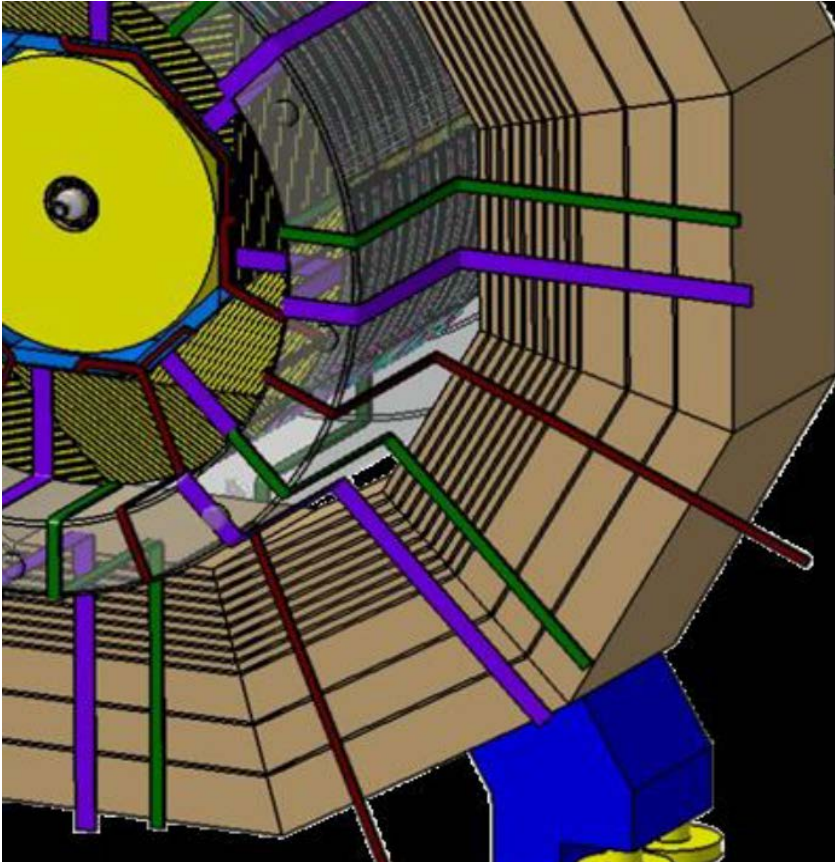


REPORT FROM THE TECHNICAL COORDINATOR

Main progress since Ichinoseki:

- **ILD integration: services/cavern utilities/DAQ**
- **Mechanical stability**
- **Beam Background simulations**
- **Costing**
- **Technical deliverables**

ILD INTEGRATION: SUBDETECTOR SERVICES



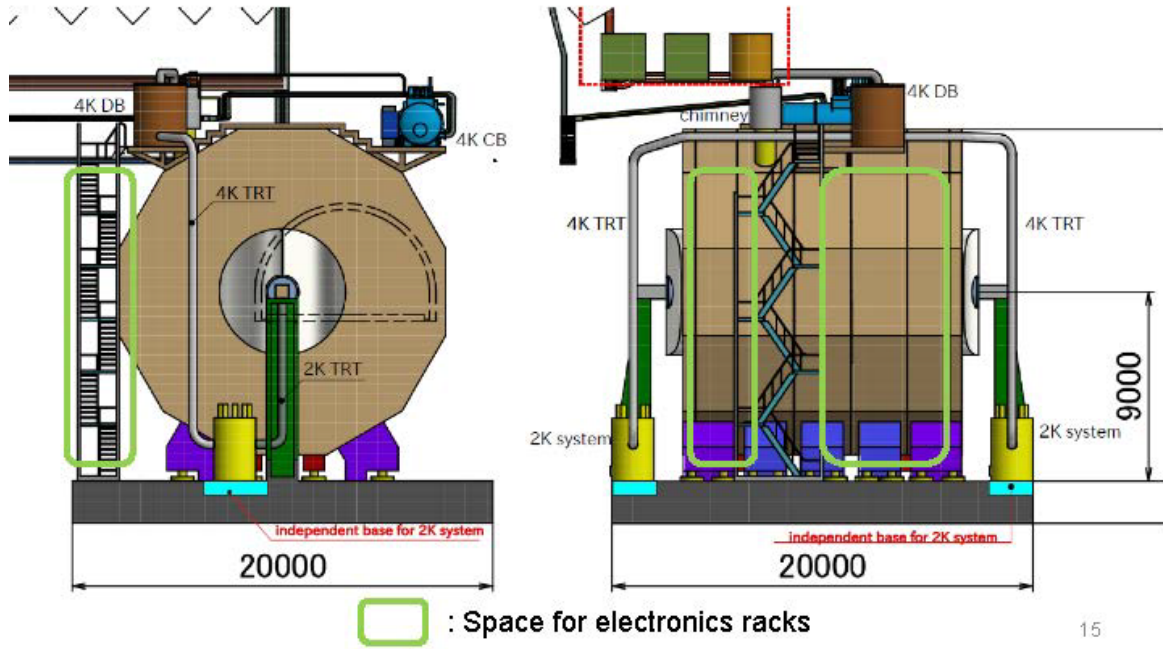
**Interface & Control Documents (ICD)
should give priority to updating information on
subdetector services (power, cooling, data cables)**

**Roman Pöschl coordinates the corresponding
update of the ILD internal cabling/service paths**

ILD INTEGRATION: CAVERN UTILITIES

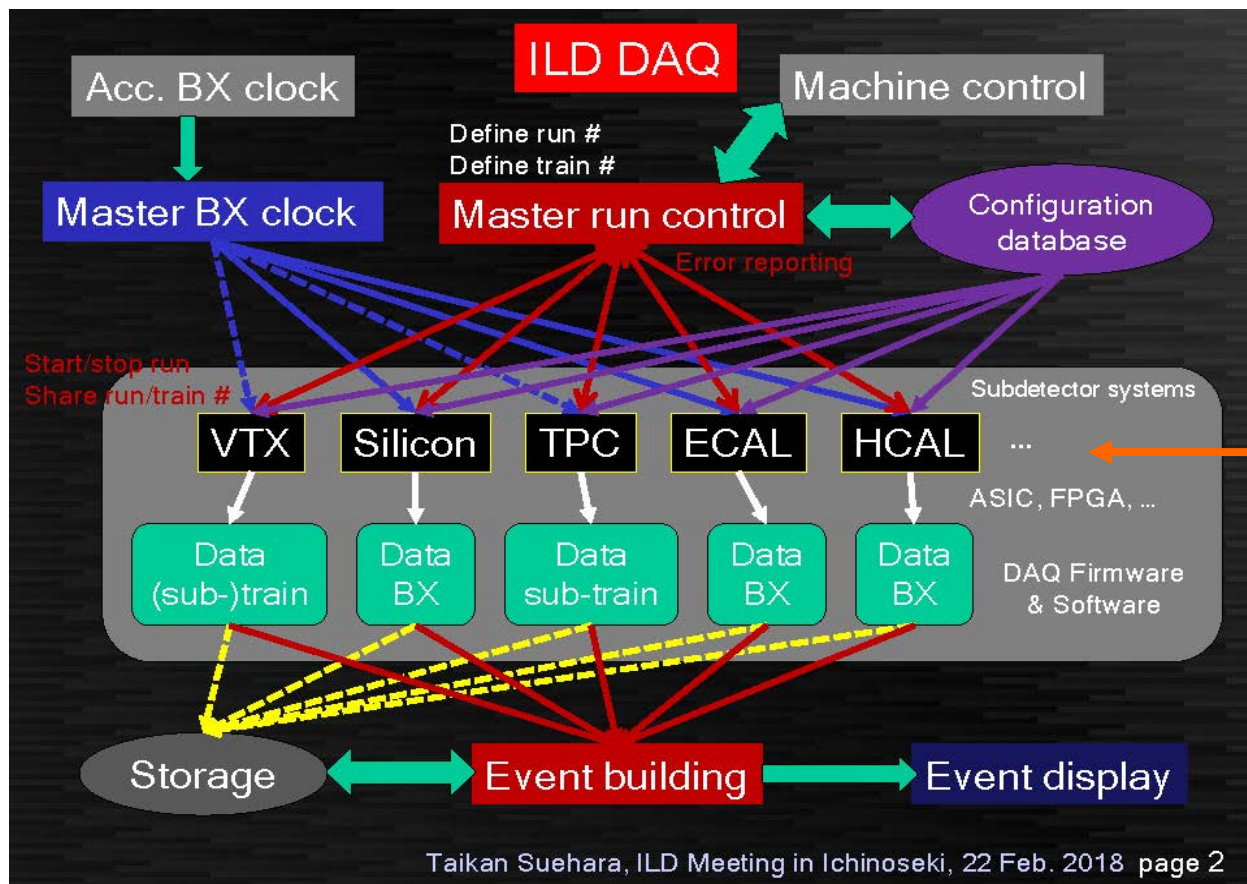
A review of ILD needs is ongoing to ensure a suitable cavern design

A list of required inputs from Yasuhiro Sugimoto has been distributed to subdetectors to gather all relevant information (should also be added to ICDs)



2018/2/23		VTX	SIT	FTD	TPC	ECAL	AHCAL	SDHCAL	Muon	FCAL
Electronics Racks	Platform	Number								
		AC power (kW)								
		Heat loss (kW)								
	Service gallery	Number								
	AC power (kW)									
	Heat loss (kW)									
U/S cavern	Number									
	AC power (kW)									
	Heat loss (kW)									
Surface	Number									
	AC power (kW)									
	Heat loss (kW)									
Cables	Detector Hall	Heat loss (kW)								
	USC	Floor	5x3x2							
Sub-detector cooling system		WxDxH (m ³)								
		AC power (kW)								
	Cooling water	Type	Chilled							
		Heat load (kW)	1							
Gas system	Platform	WxD (m ²)								
	Service gallery	WxD (m ²)								
	U/S cavern	WxD (m ²)								
	Surface	WxD (m ²)								
Laser system	Space requirement	Location								
		WxD (m ²)								





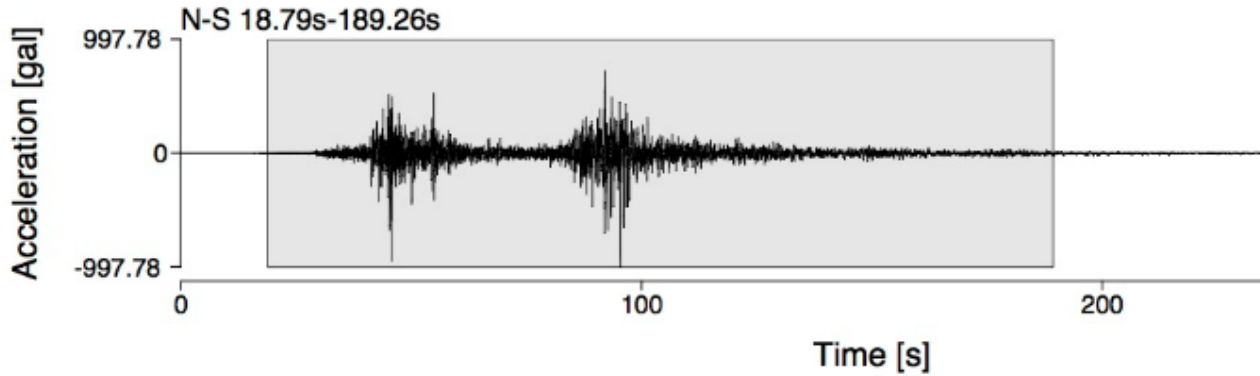
Global DAQ scheme presented by Taikan Suehara in Ichinoseki

Subdetectors are asked to specify the characteristics of their data:

- Readout structure
- Average Data sizes
- Background/physics share
- Local data processing and reduction
- Data rate to central event building
- Physical support for data transfers

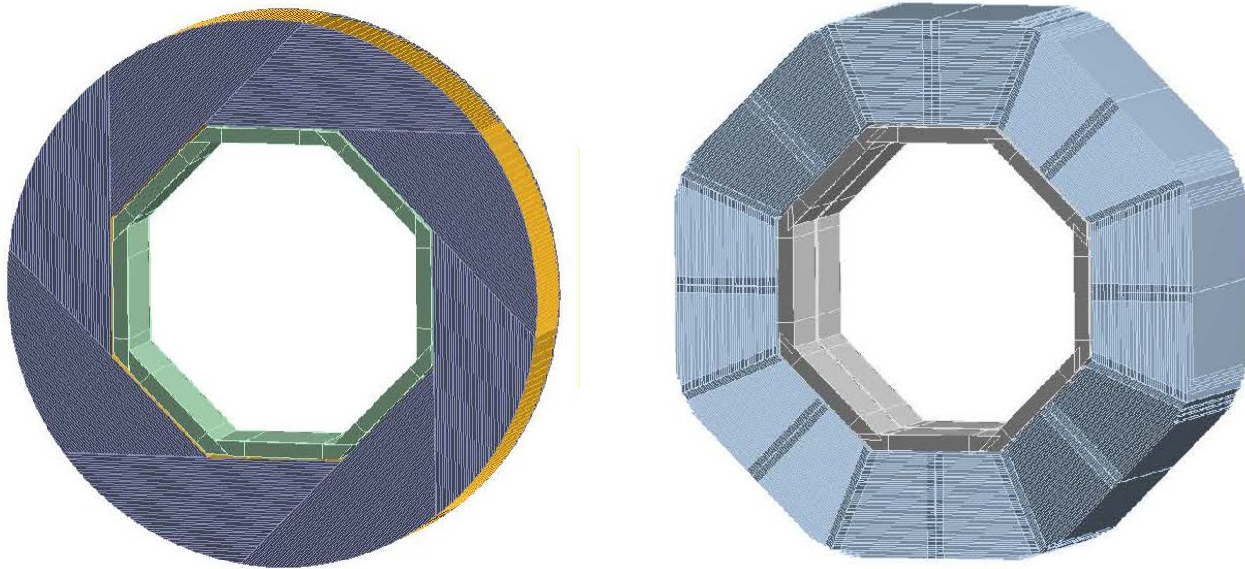
(info should also be added to ICDs)

MECHANICAL STABILITY



Reference earthquake parameters provided by Toshiaki Tauchi as analytical formulae

→ *to be used by all subdetectors for their mechanical computations*



The small group of Roman Pöschl, Henri Videau, Karsten Büsser, Felix Sefkow will organize exchange of coherent Videau/TESLA barrel mechanical models between DESY and LLR to allow cross-checks of mechanical simulations

BEAM BACKGROUND SIMULATIONS

Excerpt of my last
slide In Ichinoseki

OUTLOOK

Significant differences still exist between various beam-beam BG simulations.
Full beamline has to be implemented in DD4HEP and results have to be consolidated
→ *New contributors eagerly needed*

Thanks to Daniel Jeans and Rémi Eté for their work on
the beamline simulation and BEAMCAL reconstruction
(see software coordinator report)

A BG simulator is still eagerly waited for

COSTING GROUP

... has been set up since Ichinoseki:

CHAIR

Henri Videau seconded by Karsten Büsser
(+ technical support from Sandrine Pavy in LLR)

SUBDETECTOR CONTACTS

Auguste Besson : CMOS for Vertex&SiT

Marcel Vos: DEPFET for Vertex&FTD

Paul Colas: TPC

Henri Videau: Si-ECAL

Tohru Takeshita: Sc-ECAL

Felix Sefkow: AHCAL

Imad Laktineh: SDHCAL

Yan Benhammou: VFS

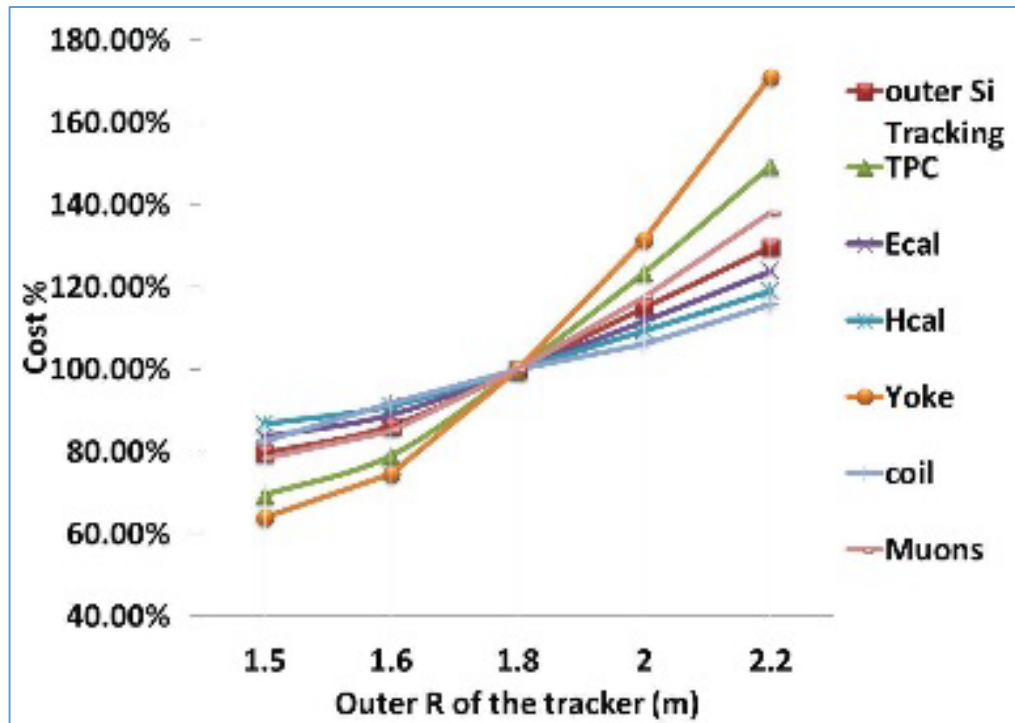
Valeri Saveliev: Iron instrumentation

Uwe Schneekloth: Coil&Yoke

	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	10836		
	Dimensional inspection of W plates	24200	plates	3D measurement system	TKMML/industry			5	?? Not a procurement
	Carbon fibres prepreg 3K for H structure	6200	m ²		Industry	0.09	540		
	Carbon fibres prepreg 3K for a veolar structure	23200	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		
	Rails fabrication (male + female pairs)	80	rails		Industry	0.5	40		
	Metal inserts	860	inserts		Industry	0.024	2304		
2.1.1.2	Monolayer alveolar structure	600					1812	15	
	Tools procurements						342	0	
	Hextool 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				
	Welding operations	all	over-night	clean room	Industry	3 days	1500	15	

COSTING PROCEDURE

Structure of Work Breakdown Sheets (WBS) to be updated by Henri&Karsten and filled by subdetectors using latest prototypes and spin-offs information.



Will be used as inputs to global costing plots made at DESY under Karsten's supervision

TECHNICAL DELIVERABLES

ILD subdetector technologies

- Overall detector structure
Subdetector layouts including updates (VFS, calo layers, silicon trackers...)
Open options for non-resolved issues: TESLA/Videau, anti-DID, calo and vertex sensors
- Subdetector prototypes and beam test results
Structure of latest technological prototypes, performance plots from beam tests

ILD global integration

- Internal integration:
Subdetector interfaces (based on interface documents) and integration scheme incl. services
Technical drawings showing interfaces (pipes, cables, supports) for each subdetector within ILD
- External integration:
Ancillary services in the cavern and on surface
Expected data throughput per subdetector and DAQ farm
- Mechanical structure studies: deformations, stability, calo integration issues ...
LLR & DESY static + dynamic computations for both structure options (TESLA/Videau)
- Coil studies: updated field maps, technological options for anti-DID ...
Uwe field maps, Toshiba sketch of anti-DID
- Beam background studies: beam-beam w and w/o anti-DID, backscattered neutrons ...
Latest computations from IPHC, VFS, SiD
- Alignment/calibration procedures
Could be adapted from Lol/DBD, but would profit from additional work

Updated cost evaluation as function of size (and techno)

- WBS tables
To be updated by subdetector groups using latest infos from technological prototypes and spin-offs
- Updated global plot cost as function of size
To be filled from updated WBS tables

**Global sketch of ILD document
presented by Ties in Ichinoseki**

**Technical chapters follow the structure
discussed in the technical group:
much information is already available and
was presented in Ichinoseki technical talks**

***Relevant plots and photos will be
gathered in the following weeks
to provide a more detailed draft
of the technical chapters content
for discussion.***