

ILD MDI/Integration Work Plan Discussion

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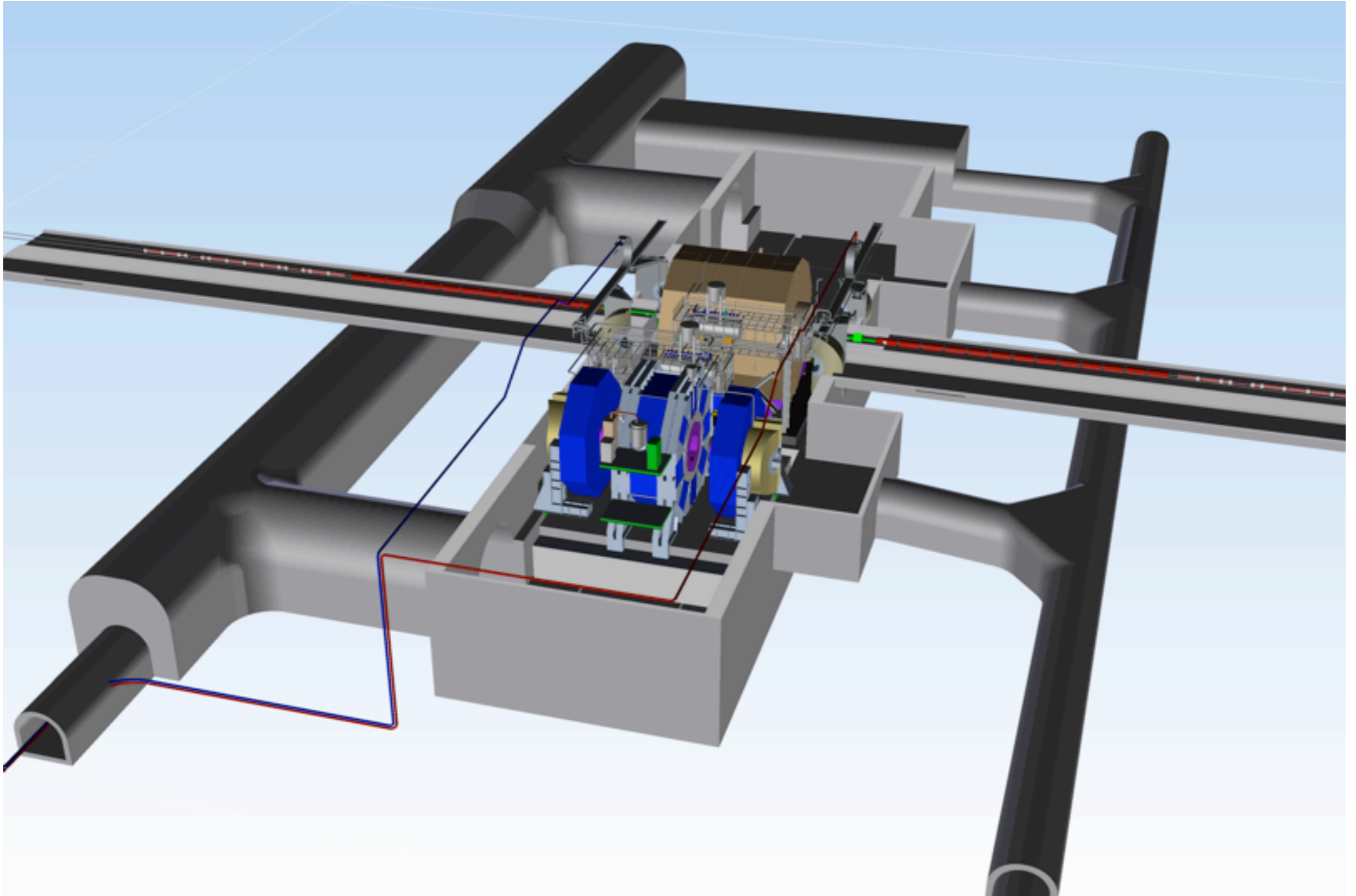
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ILD Workshop Cracow

Introduction

- We had very interesting MDI/Engineering sessions during this workshop
- We identified many open issues that need to be resolved in the next 2-3 years for ILD
- Ressources for engineering work are probably not going to increase until there is some formal push for the ILC project
 - we need to have to assign the ressources that we have as good as possible
- Main topics:
 - Adaption of ILD engineering and assembly model to Kitakami site
 - Reaction to possible design changes of ILD
 - Synchronisation with SiD and ILC machine
 - common MDI topics

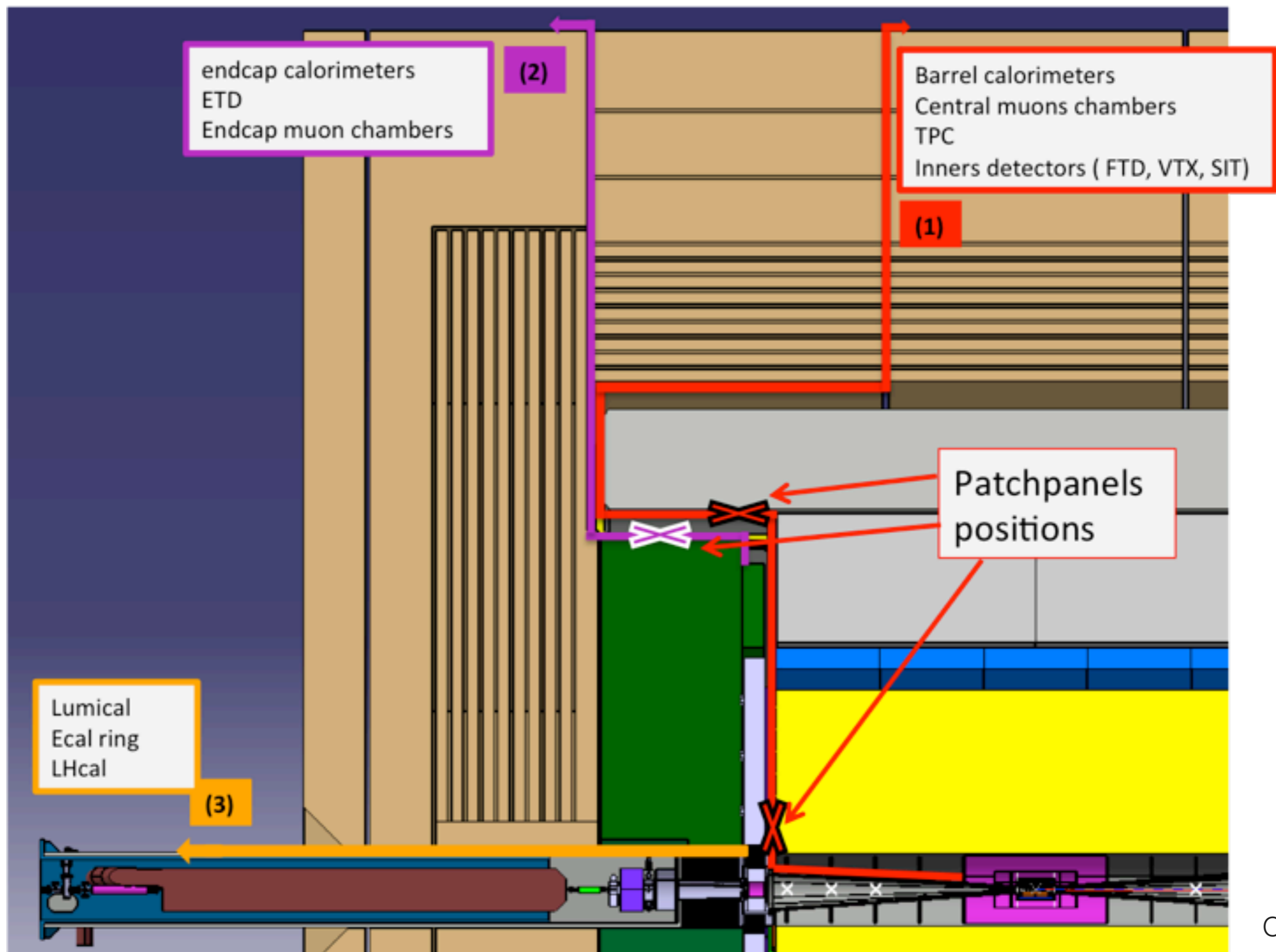
Underground Facilities



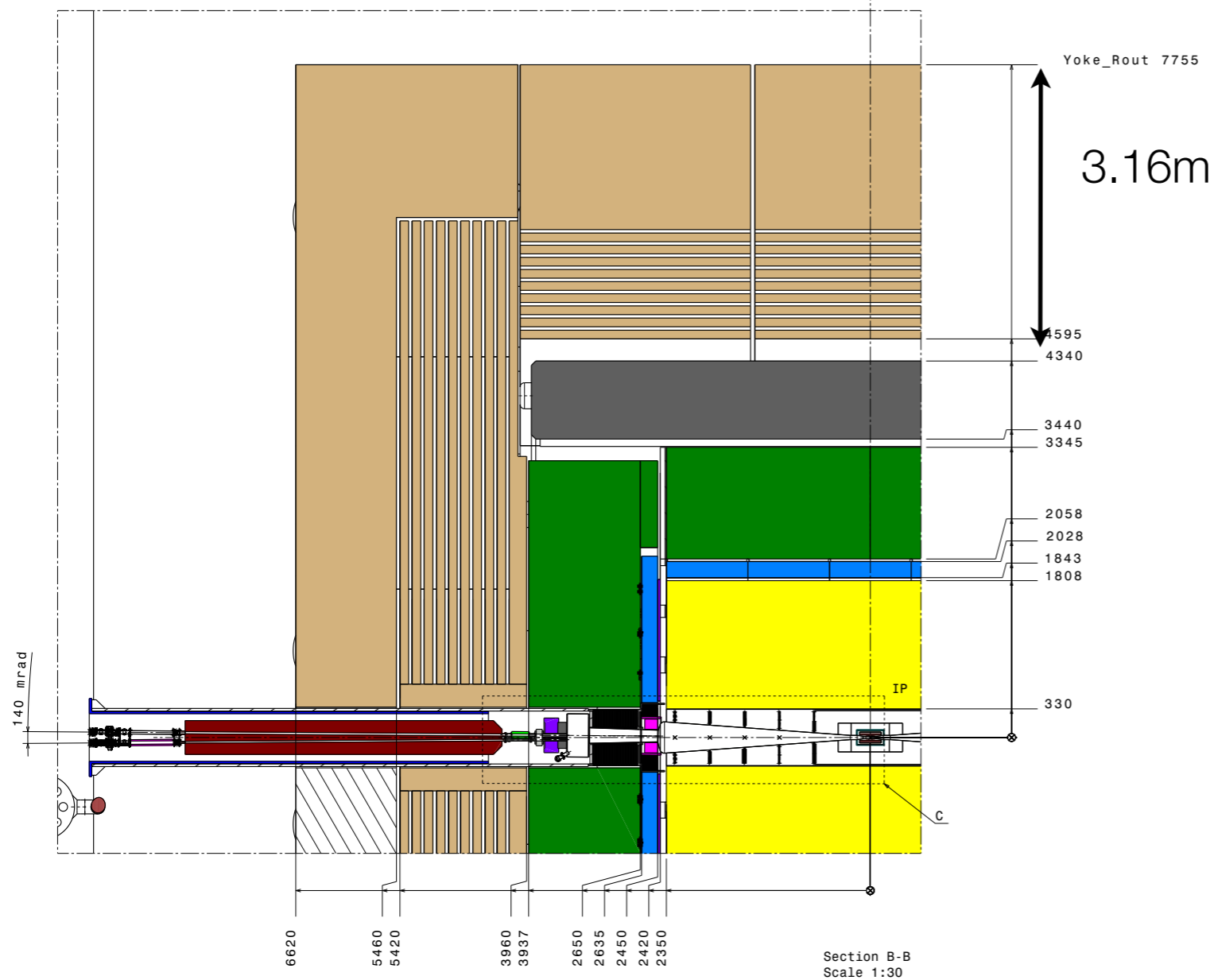
Possible Tasks

- Underground hall layout
 - ILD integration/MDI team together with experts from local site?
- Common services
 - KEK group very active in common cryogenic studies
 - Other services need to be worked out...
- Detector assembly scheme adaptation
 - ILD integration team together with subdetector experts
- Adaption of local safety rules to ILD design
 - ILD integration team and subdetector experts
- (...)

ILD Internal Integration

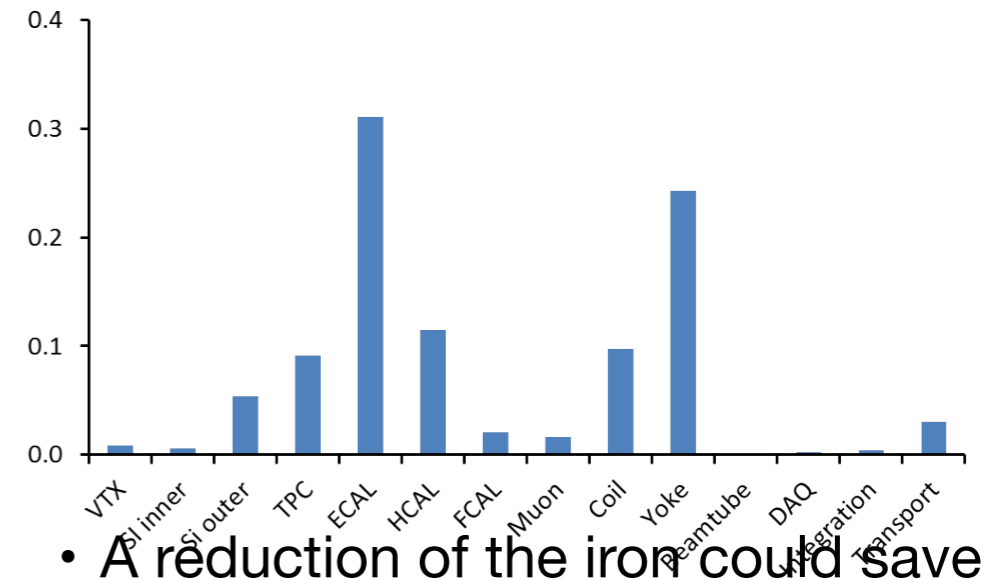


Possible ILD Design Changes



- Total cost of yoke:

- 95 MILCU
- 80 MILCU for steel and machining



- A reduction of the iron could save a lot

Possible Tasks

- Follow-up ILD integration model w.r.t. updates on subdetector designs
 - ILD integration team
- Maintaining the ILD engineering models (detailed CAD, placeholders)
 - Colleagues at LAL together with DESY EDMS support
- Better understanding of subdetector services (cables, cooling)
 - Need better communication with subdetector experts
- Adaption of safety and seismic rules to subdetector designs and full ILD
- (...)

Common Work with SiD/ ILC



- IR Interface Document
 - Functional requirements for the co-existence of two experiments and the machine in a push-pull scenario
 - ILC-Note-2009-050
 - Major milestone and deliverable for TDR
- Need to re-visit this in view of the site decision
- Started discussions with SiD

ILC-Note-2009-050
March 2009
Version 4, 2009-03-19

Functional Requirements on the Design of the Detectors and the Interaction Region of an e^+e^- Linear Collider with a Push-Pull Arrangement of Detectors

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Abstract

The Interaction Region of the International Linear Collider [1] is based on two experimental detectors working in a push-pull mode. A time efficient implementation of this model sets specific requirements and challenges for many detector and machine systems, in particular the IR magnets, the cryogenics and the alignment system, the beamline shielding, the detector design and the overall integration. This paper attempts to separate the functional requirements of a push pull interaction region and machine detector interface from any particular conceptual or technical solution that might have been proposed to date by either the ILC Beam Delivery Group or any of the three detector concepts [2]. As such, we hope that it provides a set of ground rules for interpreting and evaluating the MDI parts of the proposed detector concept's Letters of Intent, due March 2009. The authors of the present paper are the leaders of the IR Integration Working Group within Global Design Effort Beam Delivery System and the representatives from each detector concept submitting the Letters Of Intent.

ILC-MDI List of Work Topics

Priority	Task #	Description	Goal	Parties involved
10	1	Push-pull motion system	Platform design progress. There is substantial interest in the choice between rollers and airpads. Preliminary work is needed for door motion rail design; seismic restraints; and any tolerances for detector placement on the platform.	One engineer from the participant Labs/Institute/Universities. In alternative an external contractor as ARUP or a direct contact to a supplier of roller- or airpad systems like Hillman or Konecranes
11	2	Cryogenic Distribution system	Define the basic layout of the cryogenic distribution scheme for the Solenoids, the FFS and the Crab Cavities	ILD, SID, Cryogroup at KEK
12	3	Surface Assembly Facilities. Only a crude estimate of the space require for detector subsystem assembly was made.	The surface assembly for the flat site is better understood, being similar to the one developed for CMS. The surface assembly area for the mountain site has specific constraints because of the site topology. (The requirements for a mountain site are different from the flat site since the final installation from smaller pieces takes place in the underground hall.)	One engineer from Japan, having close ties with the CE group designing the Mountain site

ILC-MDI List of Work Topics

13	4	Alignment of detector to beamline after transport on platform. This presumably needs a coarse system covering the full range of motion, and an additional system with a conservative 1 mm tolerance measuring xyz and roll at both ends of the detector.	The external alignment system must be the same for the two detectors to align the detector with the integrated QD0's with respect to the QF1's and the beam axis	An alignment expert, possibly with deep knowledge of FSI or Rasnik. Alternativley a general alignment expert
20	5	Detector Services = umbilicals, interface, to CFS, routing in the Detector Hall	Revise the list of umbilicals for each detector. Define the routing in the detector hall and the interface with a CFS system	SID, ILD plus Japanese CFS contact
22	6	QD0 Prototyping	Design and Testing of QD0. RF testing. Vibration testing	BNL

ILC-MDI List of Work Topics

25	7	Sesimic requirements and solution		ILD.SDI, CE expsert
28	8	QD0 Integration	Movers, FRWD, Beam Instrumentation	ILD, SID, BNL
30	9	Magnetic field leakage	Compare the current field map with the the existing rules in Japan	ILD, SID with magnet expert from japan
31	10	Vibrations analysys	Crrrelation measuremts, cold box	ILD, SID, Expert
32	11	Radiation shielding properties of SID and ILD	Revise the worst conditions of radiation exposure like a beam loss. Compare it with the existing rules in Japan. Eventually reconsider the PACmen design	ILD, SID with a radiation expert from Japan
35	12	Beam Commissioning	Define Physics Requirements for beam commissioning without detectors	ILD, SID, Machine expert

ILC-MDI List of Work Topics

35	13	Detector internal alignment procedure	Ideally the internal alignment system will be the same technology used for the external one. The two systems should be designed as an integrated systems. FSI pursued by SID shows good potentiality. Or a Rasnik system pursued by ILD.	ILD, SID plus alignment expert (FSI or Rasnik)
40	14	Local Control Rooms. What is scope of permanent facilities associated with the experiment? Utilities. Machine shop.	Detectors will enumerate the list of the technical rooms needed for the operation and maintenance of the detectors. CFS?)	To be implemented by the Civil engineering group in charge of the site layout (J-Power or ILC-CFS)
50	15	Vacuum around the IP	Agree on the pressure distribution around IP	ILD, SID, Vacuum expert

Organisation

- Need to get an overview of available engineering resources in ILD
- Need updated list of subdetector engineering contacts
- Need to review and (re-)implement working processes:
 - Example: maintenance of central ILD CAD model at LAL, documentation and storage in ILD-EDMS, input and check of detailed subdetector models
- Should start regular (monthly?) engineering meetings (remote)
- Organise topical mini-workshops for dedicated topics
 - attached to larger meetings, regional meetings, remote
- Need to integrate into new ILD management structure
 - new „Detector Coordinator“ might have own plans