MDI/Integration Sumarry

T. Tauchi, 6th December 2007

IR Issues / tasks

IR Design Optimization with engineering studies

- beam pipes, pumps, wakefields
- innermost radius of VTX and B-field
- outer radius of support tube and inner radius of TPC
- calorimeters, pair monitor and beam instrument

Background Estimation

- pairs v.s. B-field, (anti-)DID
- muons v.s. muon spoilers, collimation depth
- synchrotron radiations v.s. collimation depth, masks
- neutrons from pairs, extraction line and dump v.s. mask

Relevant parameters for IR optimization

	GLD and GLDc		LDC
Machine parameter sets	1TeV, HiLum-1		Nominal?
L* (m)	4.5	same at GLDc	4.05
B (Tesla)	3	3.5 at GLDc	4
R_{Be} (cm)	1.5	z < 5cm	1.4
R_{VTX} (cm)	2.0	FPCCD	1.6
VTX angular acceptance	|cos|<0.95	3 super-layers	|cos|<0.952
R_{FCAL} (cm)	8	z=2.3m	8
R_{BCAL} (cm)	1 and 1.8	z=4.3m	1.3
QD0,FCAL,BCAL support	canti-lever 70cm Φ	W-tube	canti-lever 58cm Φ

Differences will be studied and tried to be understood.

Beam Pipe Design

1. Vetex chamber

   B , background, collimation depth

   neutrons with “mask (BCAL)” ? T. Abe

2. In front fo FCAL LCBDS

   Precise luminosity measurement

   Belilium/Alminum pipe - smearing effect ?

   Right angle SUS pipe - wakefield ?

3. Pump

   P>10nTorr - no baking, no pump (T. Abe)

   P> 1nTorr - no baking with NEG pumps

   electro-hadron production ?

Outer radius of support tube

1. QD0 and SD0 T. Okugi

   compact superconducting Q - cryostat

   compact permanent Q

   anti-solenoid ?

   fine-adjustment ?

2. Thickness of tungsten tube T. Abe

   minimum value - background ?

   if no background - CFRP tube ?

   support QD0, FCAL, BCAL and LHCAL ?

3. Tracking performance

   requirement - ITC layers, spacing, TPC-Rin ?

Pair Monitor R&D status

participation in FCAL collaboration

1. Simulation, K. Itoh

σ_y/σ_x from N_L/N_{tot} 3.3% for $\sigma_y < 3\ \sigma^0_y$

σ_x from R_{max} at peak of $\alpha = \log (N_i/N_{i+2})$

0.8% for $\sigma_x < 2\ \sigma^0_x$

more studies in wider range up to round beam

2. ASIC readout, R. Sasaki

a chip ($4x4mm^2$) with 6x6 pixels ($0.4x0.4mm^2$)

each pixel with AMP, comparator, counter, 16 registers

design, layout, production for a few, one and 2 months

one design - production cycle in 6 months

Detector Integration Issues / tasks

Detector and its assembly on surface Y. Sugimoto

Iron structure ; Y. Sugimoto

- deformation due to B-field
- Field uniformity and Leakage magnetic field (Tolerances?)

Solenoid and Cryostat Design (GLDc)

How to support inner detectors and QD0 (39cmΦ)

- diameter of endcap hole

Opening, closing procedures, etc. Y. Sugimoto

Underground hall requirements ;

- where to put electronic trailers, need for service caverns
- temperature, humidity stability, the gradient
- utility (power, cooling water, gases, cables etc.)
- safety for fire, earth quake

Y. Sugimoto

Differences between GLD/GLDc/ LDC

- Assembly: non-CMS / CMS / CMS style
- Thickness of iron yoke: 2.7 / 2.8 / 2.15 m
- Global shape: dodeca- / dodeca- / octa-gon
  12 / 12 / 8

Suggestion : Assembly for inclined shaft must be considered especially for sites in Japan

T. Sanuki

Experimental Hall for GLDc

working assumption at IRENG07

IR Hall Dimension ： 31m x 120m x 33m H

Detector endcap door opening ： max 6m

Crane ： 100 tonnes

Comment : Crane size largely affects the size of experimental hall .

Parameters

	SiD	GLD	GLDc	LDC	4th
HALL DIMENSIONS					
IR Hall Dimension	25m x 120m x 39m H (in RDR)		31m x 120m x 39m H	30m floor x 120m x 39m H	
Floor of Detector Hall			6.9m + 1 m to the flat surface of the IR hall		
traveling platform w/ Hillman rollers					
sub floor trenches for cables					
fixed floor - no platform					
width of hall	25m	39m	31 m	31m	
Detector end cap door opening	max 2 m		max 6 m		
CRANE CRITERIA					
crane capacity per crane		~400 tonne	~100 tonnes		

We need to communicate with Acc. people.

Push-Pull Isseus

- re-commissioning machine operation T. Okugi
- alignment of VTX and QD0
- slow settlement (100μm/month is tolerable ?)
- Radiation, shielding around beam line T. Sanami
- Cryogenics system for solenoid, QD0
- Commissioning during assembling detectors discussion
- “Large” platform scheme H. Yamamoto

Re-commissioning process by T. Okugi

(1) initial alignment less than 1mm (long, 3 mm)
(2) BBA of QD0
(3) IP position scan for collision - the major task
the most time consuming item !
(4) Luminosity scan by changing SD0 transverse position
(5) beam size tuning by sextupole (SD0, SF1) -knob

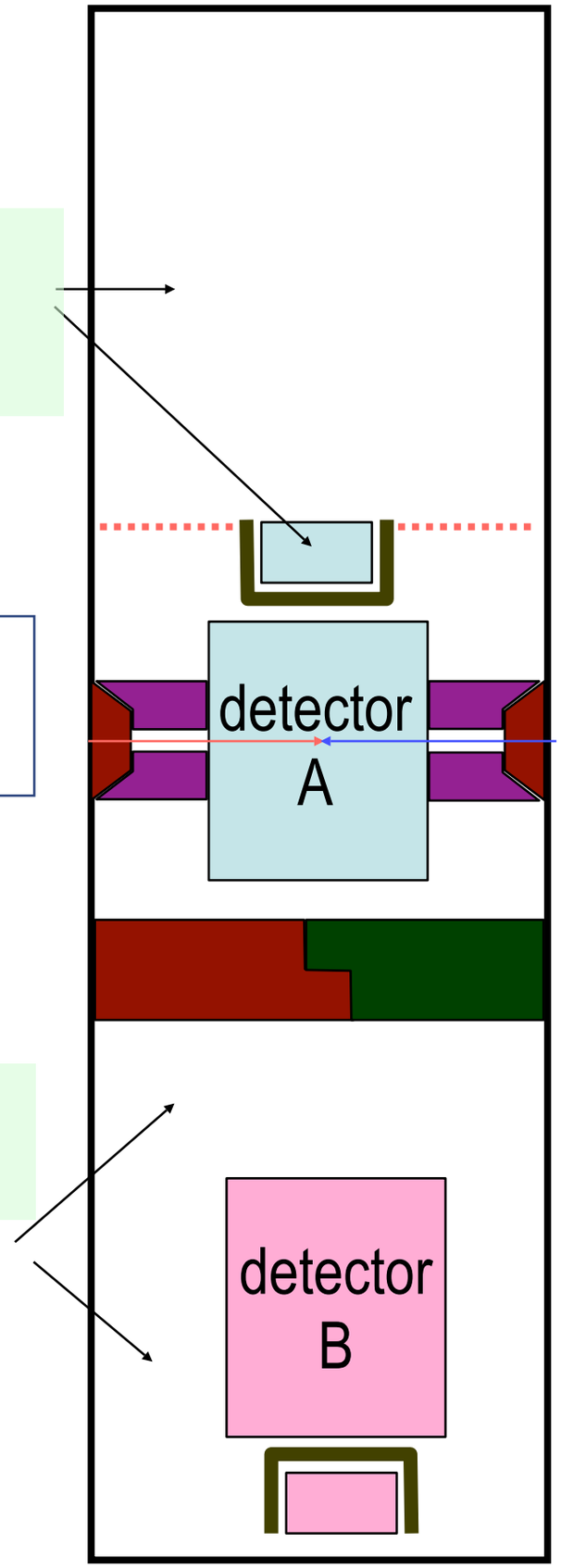
→ Movers each for QD0,SD0 (QF1,SF1)

“original” platform

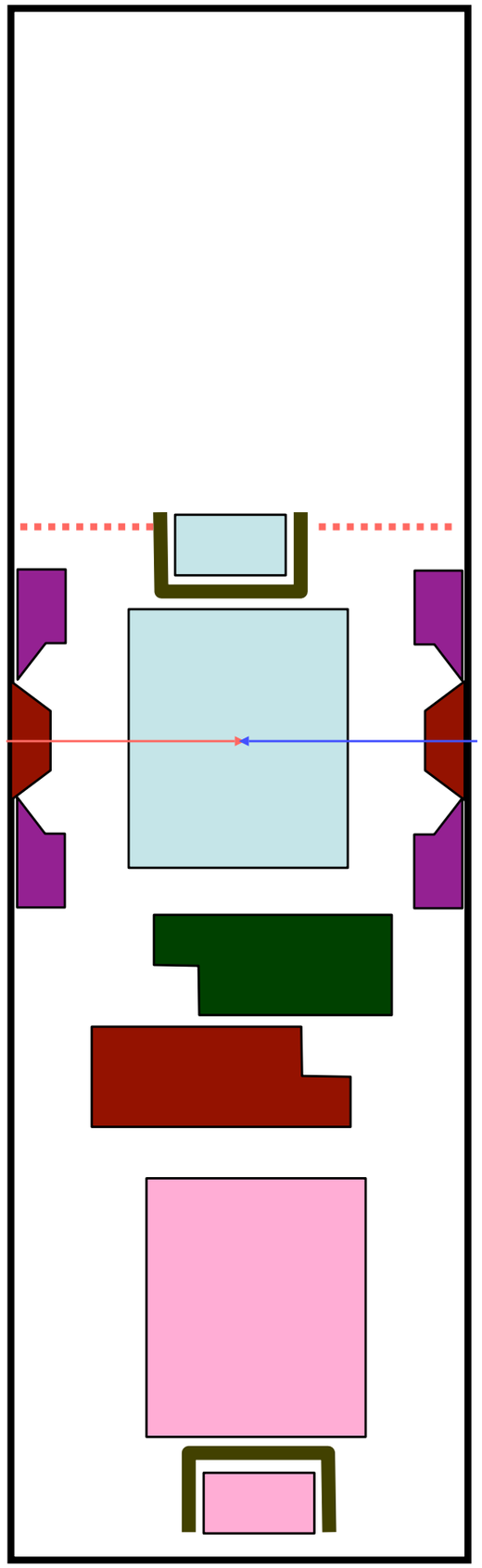
A. Seryi

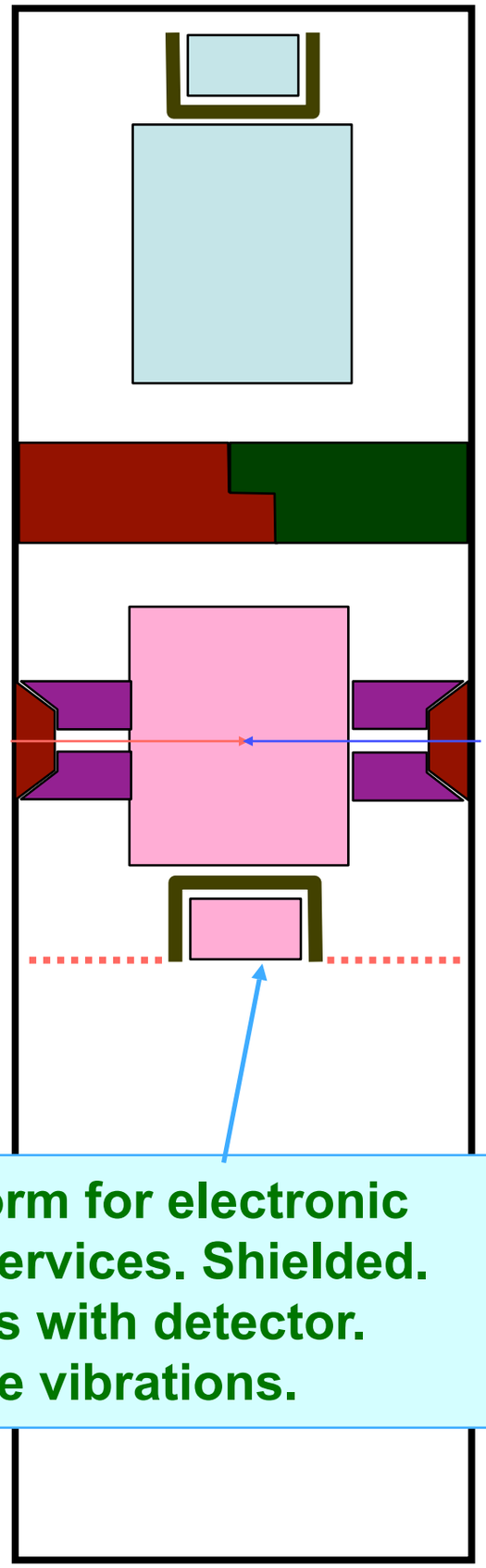
may be accessible during run

Slide as of ~Oct 2006



accessible during run



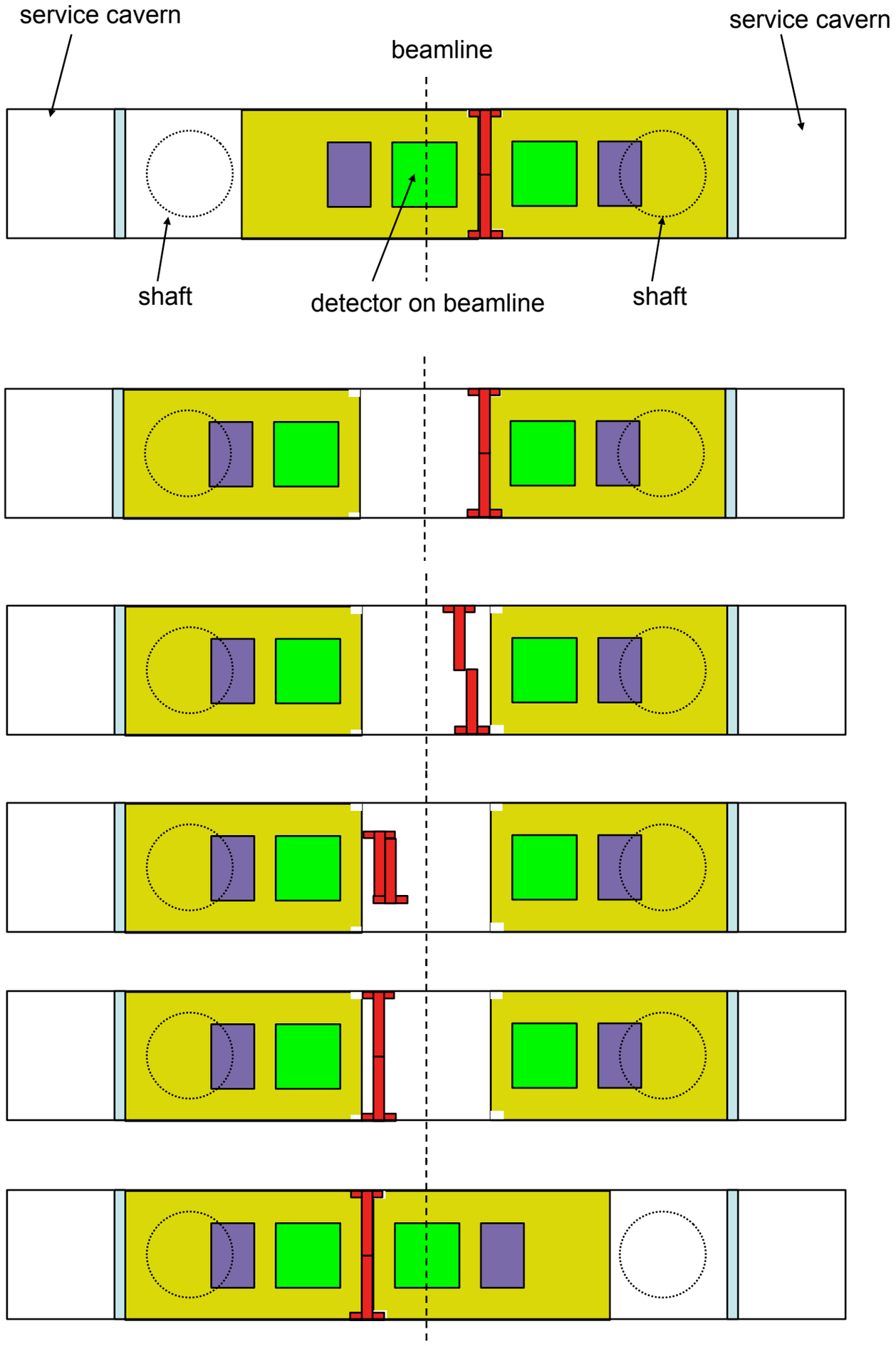


Platform for electronic and services. Shielded. Moves with detector. Isolate vibrations.

Stability
Reproducibility

Large platform

H. Yamamoto



WG Organization

1. Sub working groups to be organized

- IR design optimization
- Detector integration

2. Engineering studies

- Engineers at institutes :

  C.Clerc,M.Anduze(LLR),M.Jore (LAL),K.Sinram,N.Meyners(DESY)

  H.Yamaoka, Y.Higashi, N.Higashi (KEK)

- Engineering level :

  Conceptual design for LoI by 1 October 2008

  Technical/engineering design for EDR by July 2010

3. How to share tasks ?

  from issues to tasks (personnel and responsibility)

Suggestions in discussion

1. Roadmap of MDI/Integration towards LoI
2. Technical coordination group

   each one from KEK, DESY and France (LLR, LAL)

3. CAD librarian

   Necessary ？ for EDMS (DESY)

4. Common data base

   BDS data will be stored and managed in EDMS.

   Detector geometrical data in EDMS also ?

FFIR meeting, 11 December, 13:00- , 3-425, KEK

FFIR meeting

Tuesday 11 December 2007
from **13:00** to **15:00**
at **KEK 3-gokan, 4F**
meeting room (*3-425*)

FFIR meeting would be MDI/Integration meeting

Tuesday 11 December 2007 |

Tuesday 11 December 2007

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13:00->*15:00* **Plan for LoI**

13:00 3D-CAD model of GLDc (20')

13:20 Discussion on "Concept for the ILD Integration Plan" (1h00')

Especially we would like to discuss on technical coordinator and CAD librarian,
and work plan for ILD workshop, 14-16 January 2008, Zeuthen -DESY.

MDI/Integration meeting, 17 Dec., 17:00-19:00 , 3-425, KEK

MDI/Integration Meeting

Monday 17 December 2007
from **09:00** to **11:00**
chaired by:
Karsten Buesser (DESY)

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09:00 Discussion of Working Plan (20')	17:00 (Japan)	all
09:20 Plans for Zeuthen Workshop (20')	17:20 (Japan)	all