Report on B2GM @ KEK

Pre-Meetings: 11.11. and 12.11. 2013

- Status RVC
- BEAST workshop

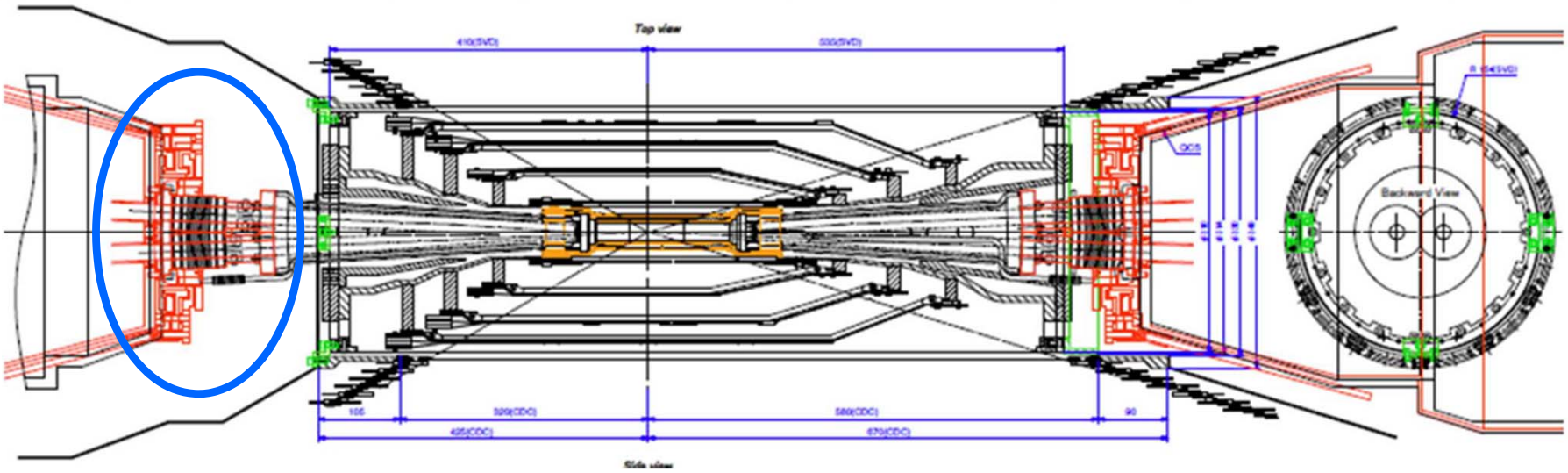
B2GM Meeting: 13.11. – 16.11.

- selected topics for today‘s report:
  - Overview by T.C.
  - Status of TOP,
  - General scheduling
  - Manpower for Installation Phases
  - Gemba Meetings
  - IB/EB: Video conferencing

Post-Meetings: 18.11. and 19.11.

- VXD Mechanics/Installation Meeting
- CO2 Meeting
- Outer Detector Meeting

RVC Status (Karsten & Carsten)

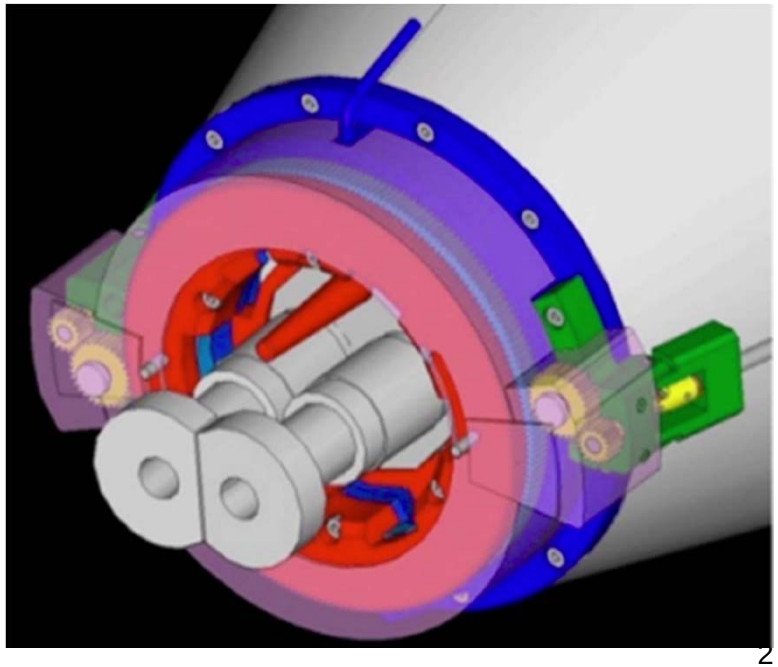


RCS has been proven to work,

Recent adaptation to the new BWD QCS design by Karsten

RVC considered as attractive option for BWD QCS connection by machine (K. Kanazawa)

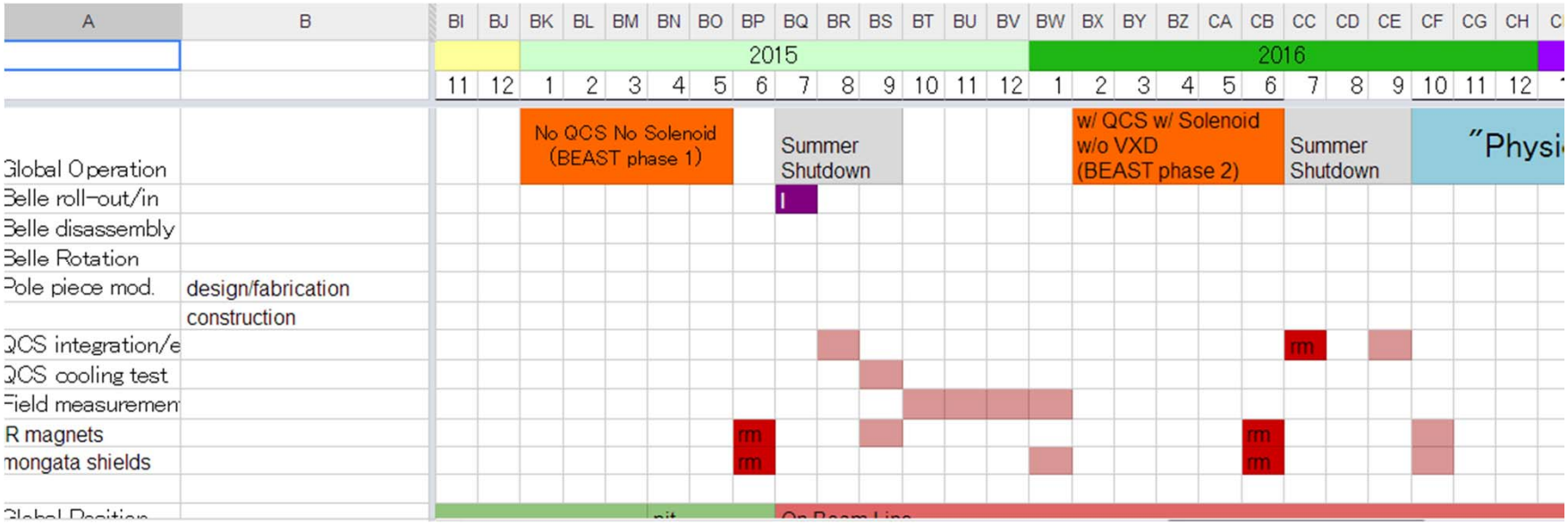
Hope that RVC is also accepted for FWD
-> needs proof of working AIM (see later)



BEAST Workshop („BBG“ Group)

- https://docs.google.com/spreadsheet/ccc?key=0Ap1uZWWWy6I0dFpSZzlMRllsTU9DM1Y1ZjBaN1o3NUE&usp=drive_web#gid=19

  To be finalized during B2GM?



Key dates:

Phase I (No QCS, No Belle Detector): Jan 2015

Phase II (QCS, Belle, no VXD, partial iTOP): Feb 2016

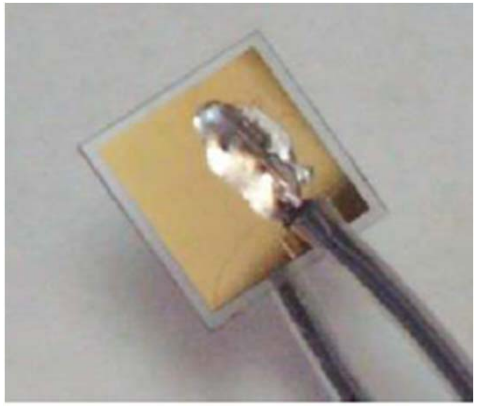
Phsase III (QCS, Belle, VXD, full or partial iTOP?): October 2016

BEAST II Phase

VXD Presentation by Carlos for phase II:

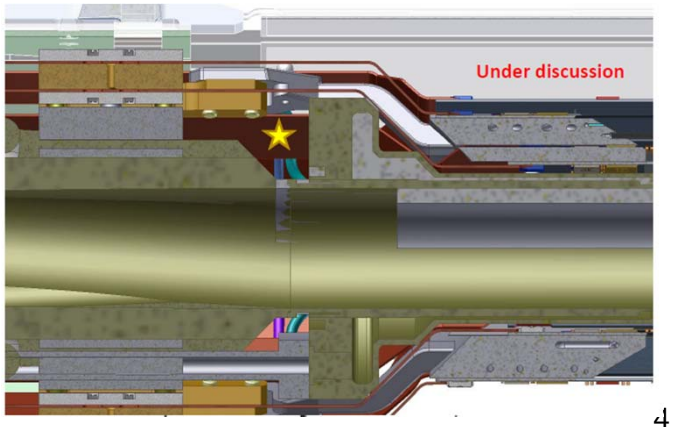
no interest in phase I

- 2 PXD half ladders (L1+L2)
- 4 SVD single modules (L3-L6)
- Thermal envelope+cooling (air+CO_2 t.b.d)
- PXD cooling blocks and 'some' SVD support structure
- BEAST II specific monitoring
  → Synchrotron radiation
- General monitoring
  → Radiation, temperature, humidity, beam loss

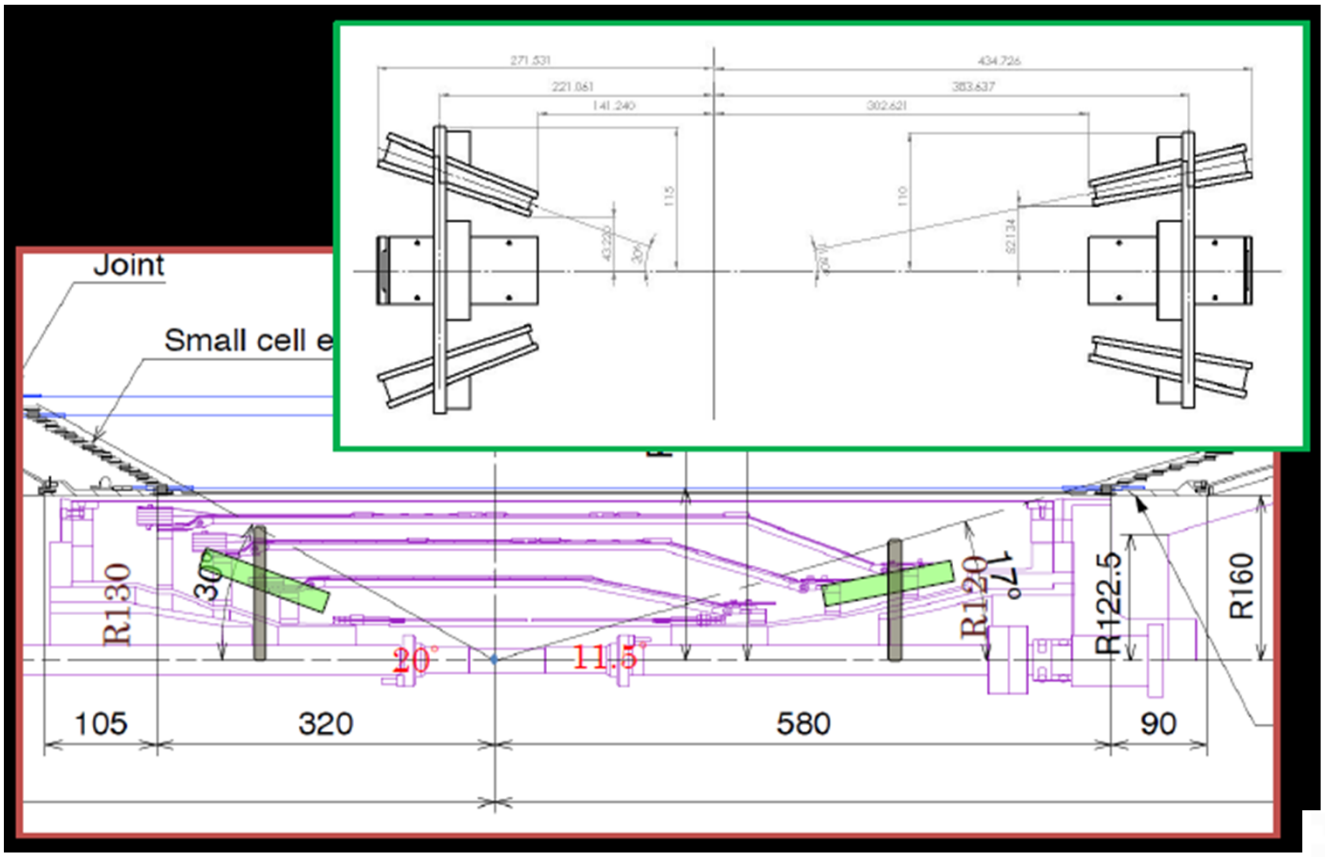


Diamonds for rad. Monitoring (collaboration with Trieste)

Proposed location for the diamond detectors in the PXD
(SVD: around the end rings)



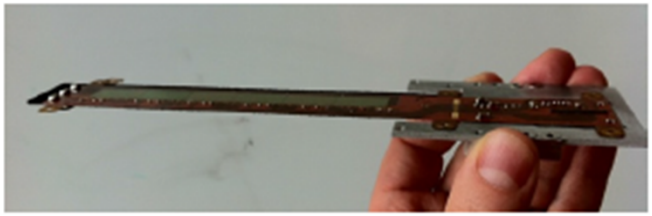
BEAST II Phase



BGO crystals for luminosity measurement

(+ 0degree monitor)

Taiwan group



Proposal for Mimosa detectors from Strasbourg group
(collaborating with DESY and Bristol)

Some highlights to watch at this B2GM

- Beast II workshop and preparations for first beam in Jan 2015.
- CDC wire stringing is nearly complete
- BKLM module installation nearly done.
- First TOP bar from Zygo, ~50 ps time resolution on the bench with lasers from IRS3B. Plans for quartz production.
- "*The mother of all beam tests*" planned for Jan 2014 at DESY coming together, tests integration of PXD, SVD and full readout chain via the new "pocket DAQ" (*now working !!)*
- Preparing for a multi-nation assembly of SVD ladders. Mechanical design will be finalized very soon.
- Responses to the BPAC focused review of TOP and VXD -- →19 page report posted at http://kds.kek.jp/materialDisplay.py?materialId=0&confId=13464

From Tom Browder's Introduction

Progress/status to be reported

- BKLM installation, repair and test
- KLM readout; Cable length of KLM preamp to readout crate and location of crates
- EKLM module production and installation schedule
- Mass production status of ECL electronics
- TOP QBB design
- TOP readout electronics
- Mass production status of HAPD and acceptance test
- Readiness for mass production of Aerogel
- Readiness for mass production of CDC electronics
- SVD ladder assembly preparation
- SVD FADC firmware development and test
- DEPFET matrix and E-MCM
- L1 trigger simulation and firmware development
- POCKET DAQ test status

From Y. Ushiroda's Report

More issues to be discussed before/during/after B2GM

- VXD installation methods
- VXD heat management
- Preparation for DESY beam test
- Preparation for TOP mini-review in Dec.
  - Electronics
  - Quartz bar box design
- One more floor on the cable tower in B-side (?)
  - Location to be discussed at gemba meeting:
    - PXD PS racks
    - TOP chiller
    - TOP RO crates around Belle
    - KLM RO crates around Belle

TOP uses Nitrogen gas, not dry air, so that inside of QBB is kept extremely clean. VXD uses dry air as there's no specific reason to use N_2

TOP Status (foils by J. Fast, PNNL)

Current Situation

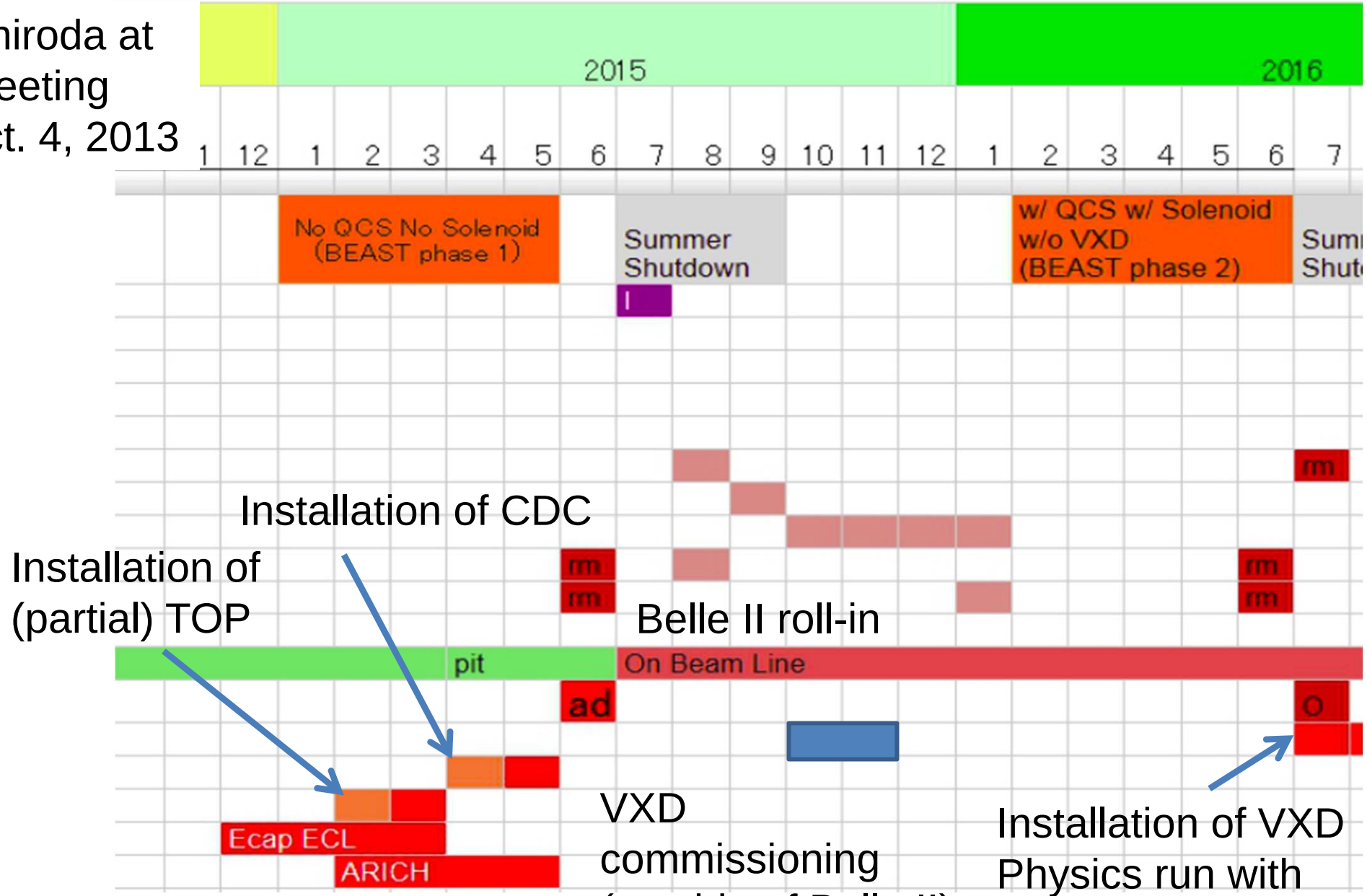
- TOP group is working as hard as possible to meet address the technical recommendations from previous reviews
  - December BPAC review is critical to success
  - TOP sessions at this B2GM are focused on preparing for that review
- Funding “Plan B” has been developed to allow for quartz procurements to start April 2014 regardless of US Congress inaction
  - Decision will be taken as soon as it is clear US project can’t go ahead
  - Hope remains that Plan A (US Project) can go forward
  - Some work must be started at KEK ahead of this decision so that contracts can be let at the start of JFY14 in the event of Plan B
- Plan A and Plan B lead to April 2014 start of production of quartz

TOP Status (foils by J. Fast, PNNL)

- Given delays in technical readiness for production, full TOP can not be installed in February-March 2015
- Partial TOP will be installed on schedule
  - Current estimate is 10 modules; minimum 8, maximum 12
  - Much experience has been gained with quartz vendors – good and bad – so we have a much better understanding of delivery schedules giving us reasonably high confidence in meeting this schedule with April 1 orders
  - Quartz schedule is being accelerated at vendors at significant additional cost to be able to field as many TOP modules as possible by March 2014
    - e.g. 25% higher average cost for bars to use more reliable vendor for majority of production (~$1M additional cost to the project)
  - Significant resources (people and facilities) are being assembled at KEK to allow for two parallel production lines for TOP module assembly so we can have as many modules as possible ready to install by March 2015
- Remaining modules will be installed later (summer 2017 shutdown)

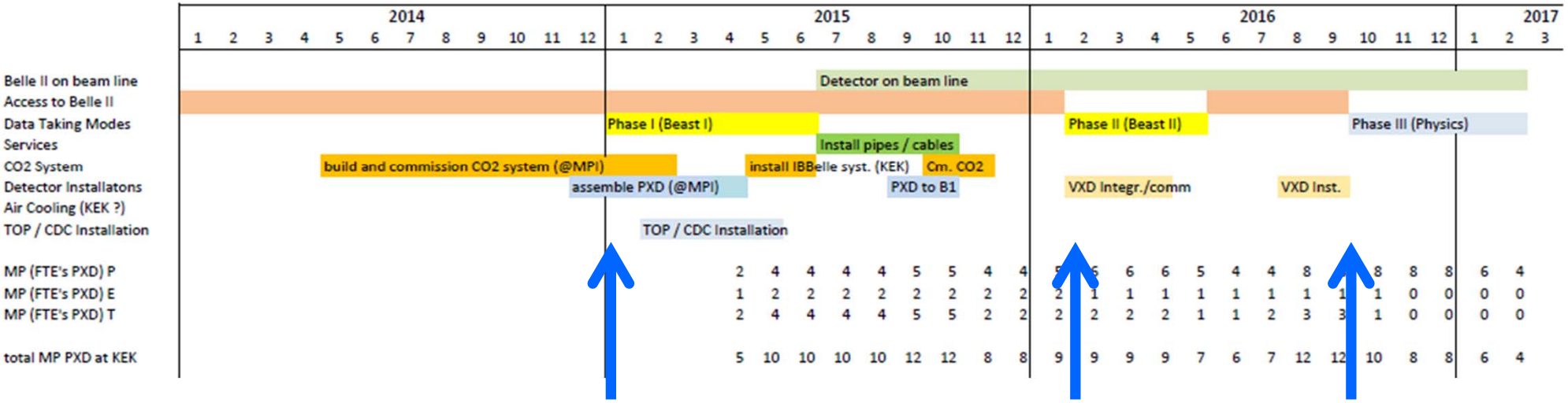
General Schedule for Belle II

Y. Ushiroda at EB Meeting on Oct. 4, 2013



Tentative Plan for Beast and PXD (I)

Installation and Commissioning (BEAST + VXD)

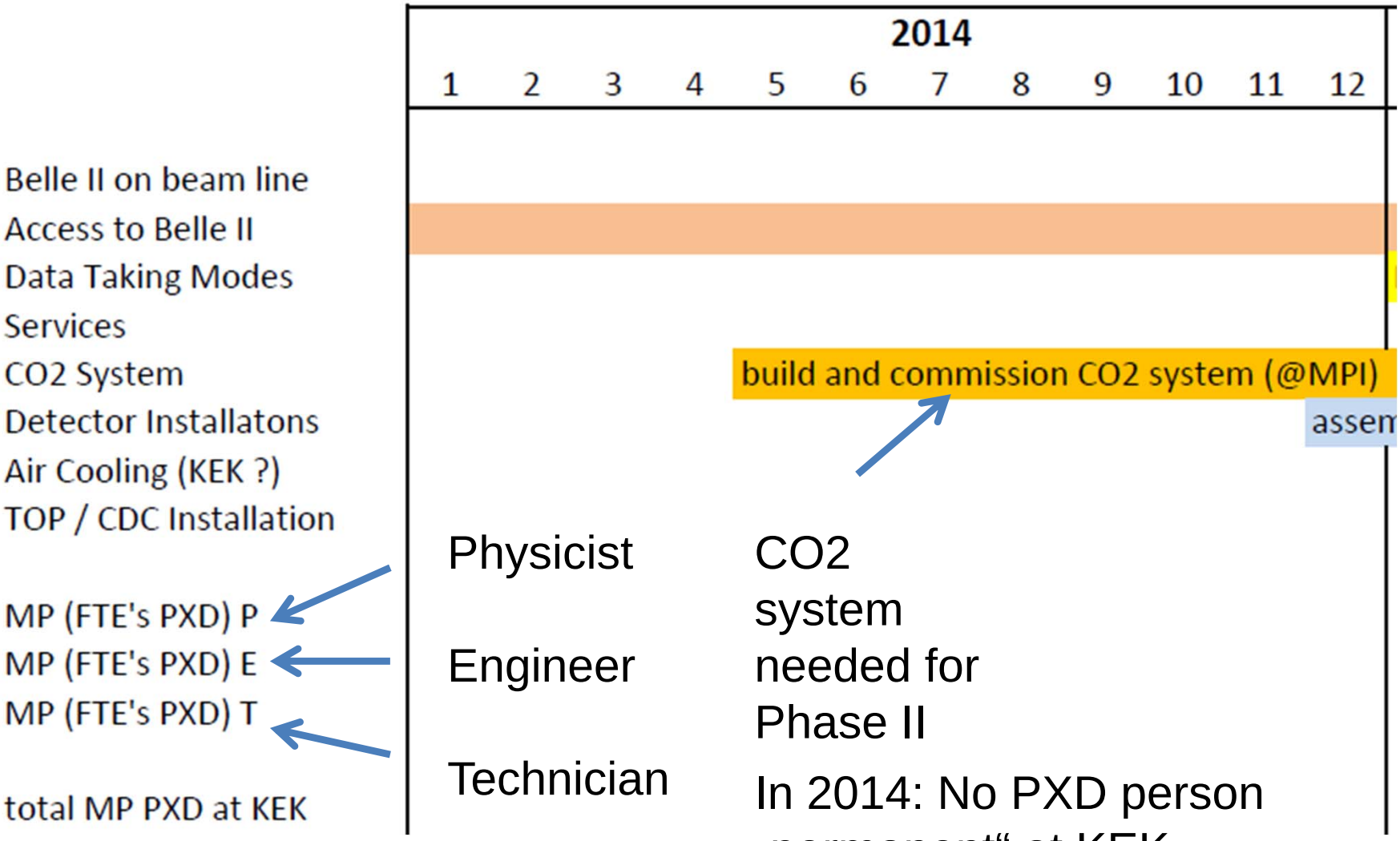


Key Commissioning Phases:

Phase I:	Bake-out (+Beast I) (no Belle, no QCS)	Jan. 2015
Phase II:	BG optimization, target lumi = 1 x 10^{34} cm^{-2} s^{-1} (with Belle + partial TOP and QCS)	Feb. 2016
Phase III:	„Physics“ (with Belle + partial TOP and QCS and VXD)	Oct. 2016

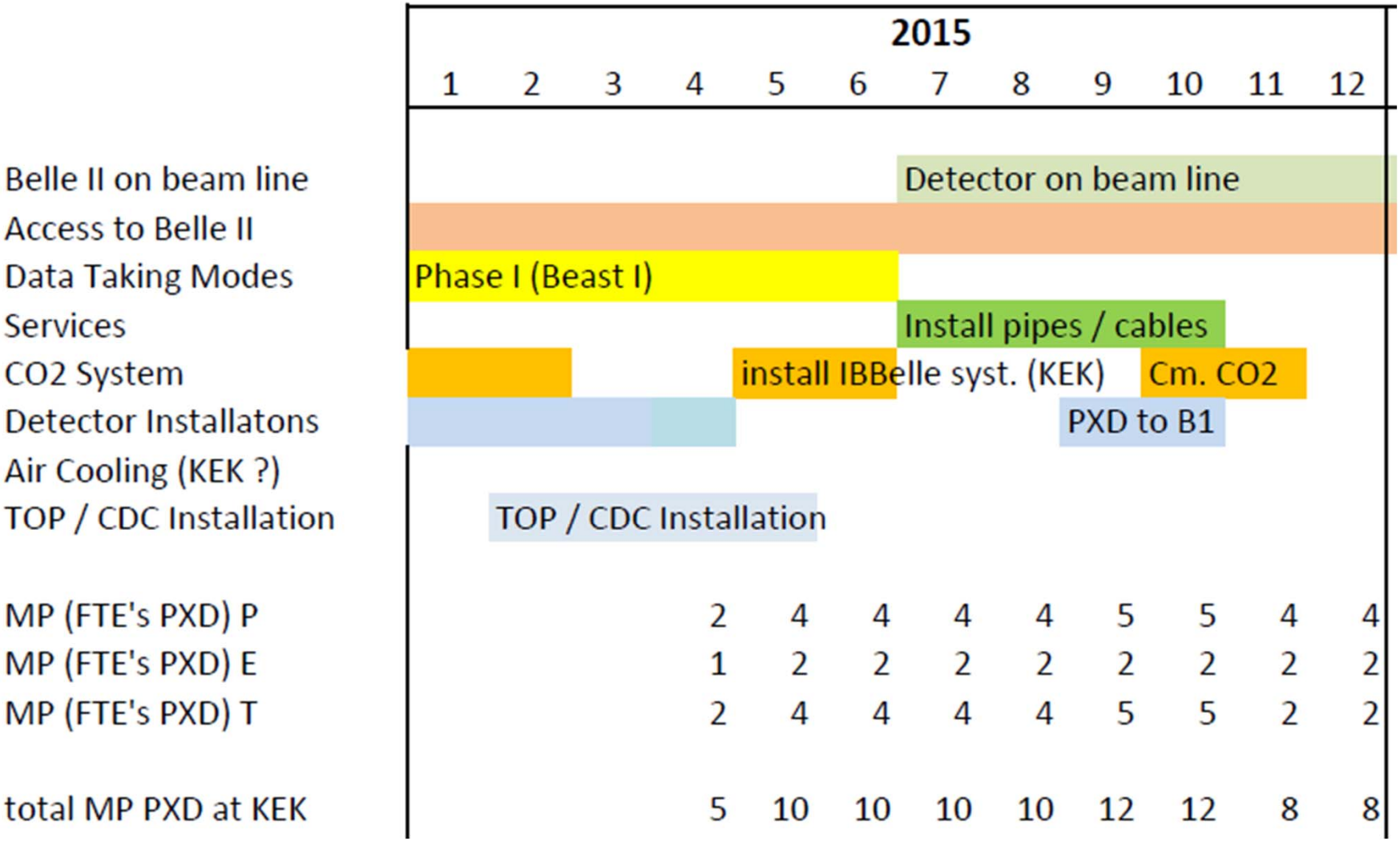
Tentative Plan for Beast and PXD (II)

Installation and Commissioning (BEAST + VXD)



Tentative Plan for Beast and PXD (III)

Installation and Commissioning (BEAST + VXD)



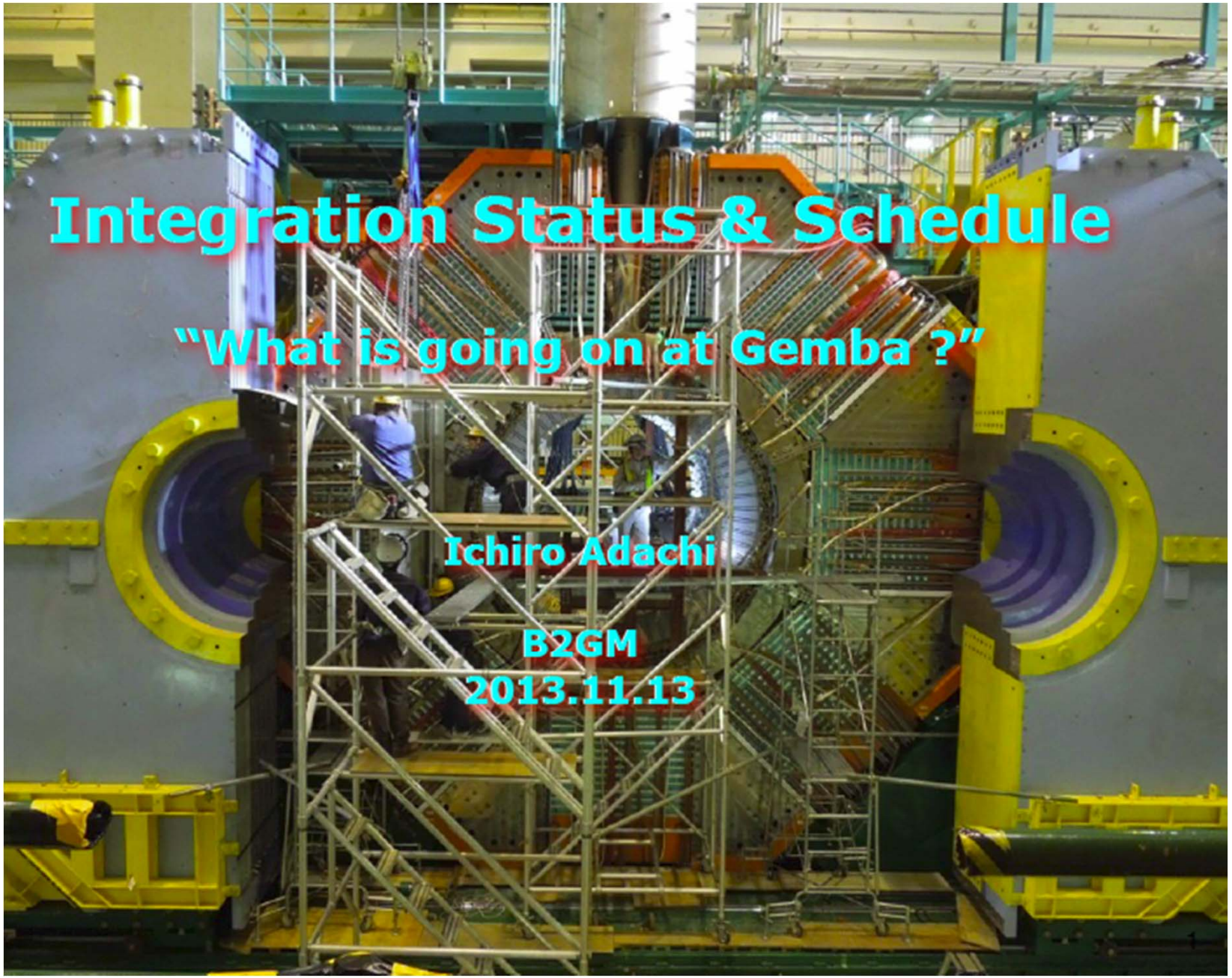
Tentative Plan for Beast and PXD (IV)

Installation and Commissioning (BEAST + VXD)

	2016											
	1	2	3	4	5	6	7	8	9	10	11	12
Belle II on beam line												
Access to Belle II												
Data Taking Modes		Phase II (Beast II)								Phase III (Physics		
Services												
CO2 System												
Detector Installatons		VXD Integr./comm						VXD Inst.				
Air Cooling (KEK ?)												
TOP / CDC Installation												
MP (FTE's PXD) P	5	6	6	6	5	4	4	8	8	8	8	8
MP (FTE's PXD) E	2	1	1	1	1	1	1	1	1	1	0	0
MP (FTE's PXD) T	2	2	2	2	1	1	2	3	3	1	0	0
total MP PXD at KEK	9	9	9	9	7	6	7	12	12	10	8	8

This is just a first plan, your suggestions are welcome

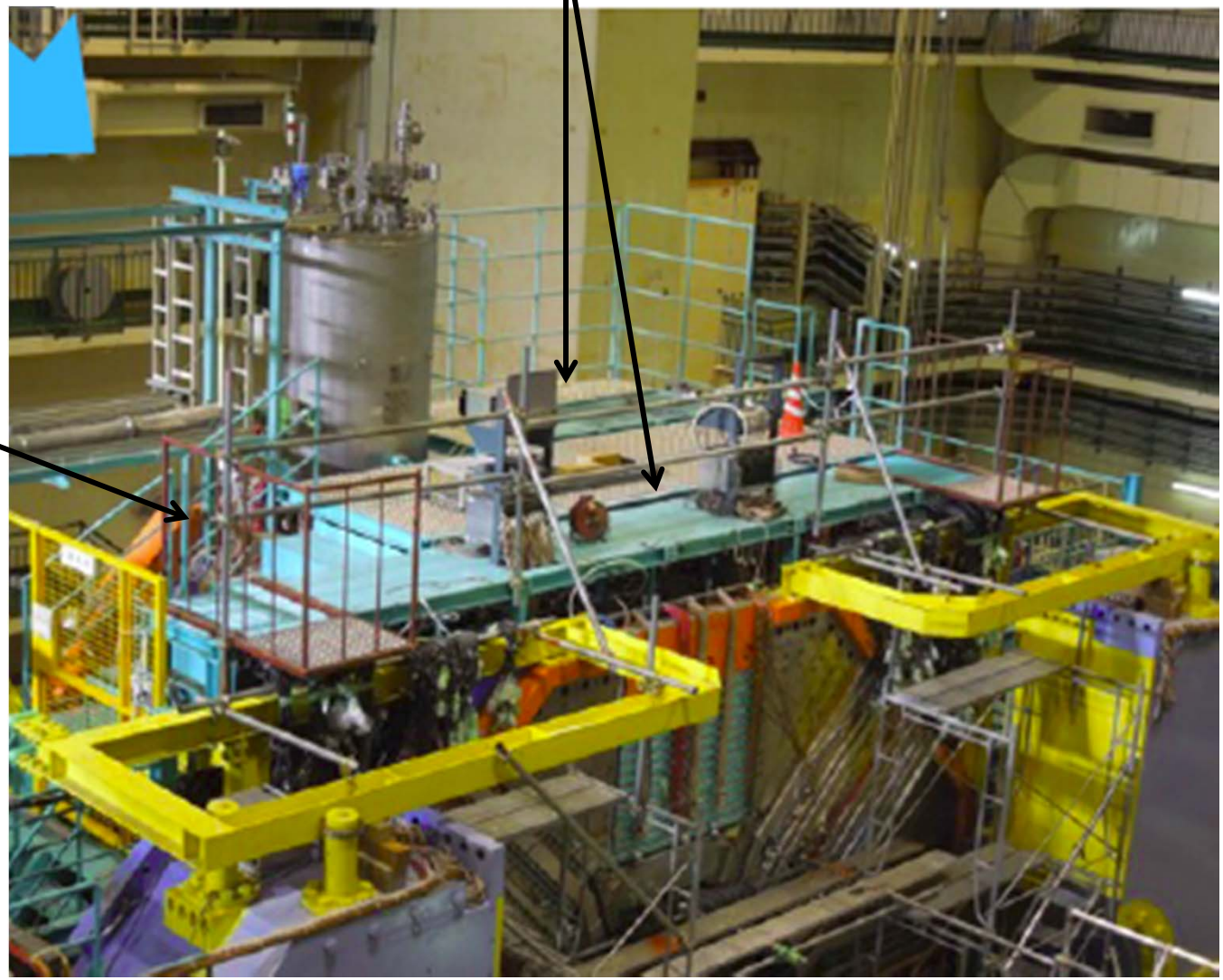
Gemba Meetings



Gemba Meetings

Location now fixed for DHH racks (FWD and BWD)

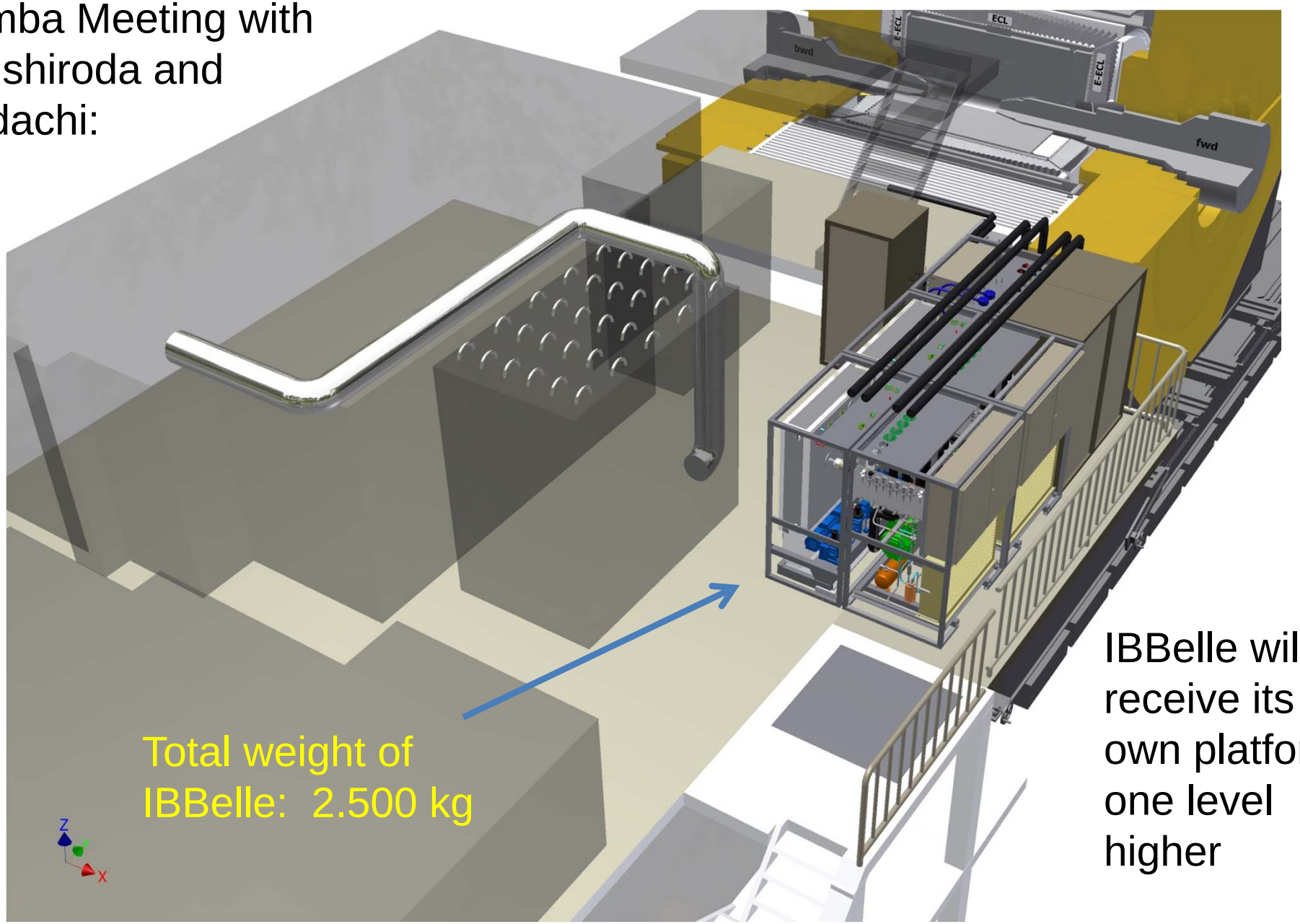
also the PS location (new platform) is confirmed now



IBBelle (2.5 t) will receive a new platform, and balconies for the manifolds
(all servicible parts outside radiation area)

IBBelle Location in Belle II

Gemba Meeting with
Y. Ushiroda and
I. Adachi:



IBBelle will receive its own platform one level higher

Communication in Belle II

- *Thanks to the EB committee on Belle II video-conferencing:* F. Bianchi, Z. Dolezal, T. Hara, C. Hearty (chair), and L. Piilonen.
- SeeVogh is expensive and of variable quality; communication in Belle II is deficient.
- After investigation of options: the committee recommends the use of two systems: READYTALK and *TEAMSPEAK*
- SeeVogh will no longer be available after December 2013.

- https://belle2.cc.kek.jp/~twiki/bin/view/Main/AudioVideoConferencing

From Tom Browder's Introduction

Replacement of Seevogh (?)

Strong criticism of the (bad) audio quality of Seevogh

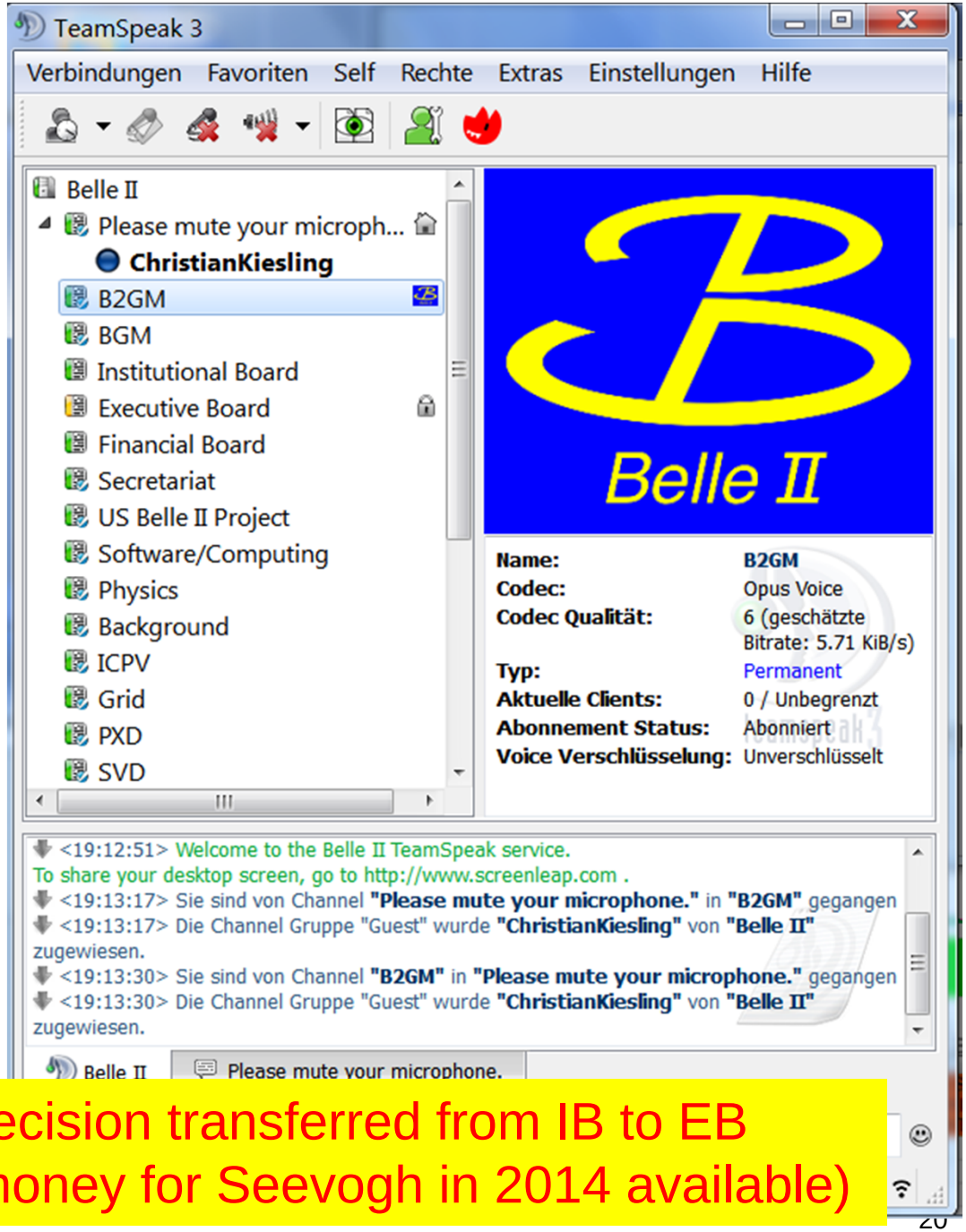
alternatives recommended:

- TeamSpeak
- ReadyTalk

Both systems are inferior to Seevogh (my opinion):

- No screen sharing
- No list of participants
- Same audio feed back problems

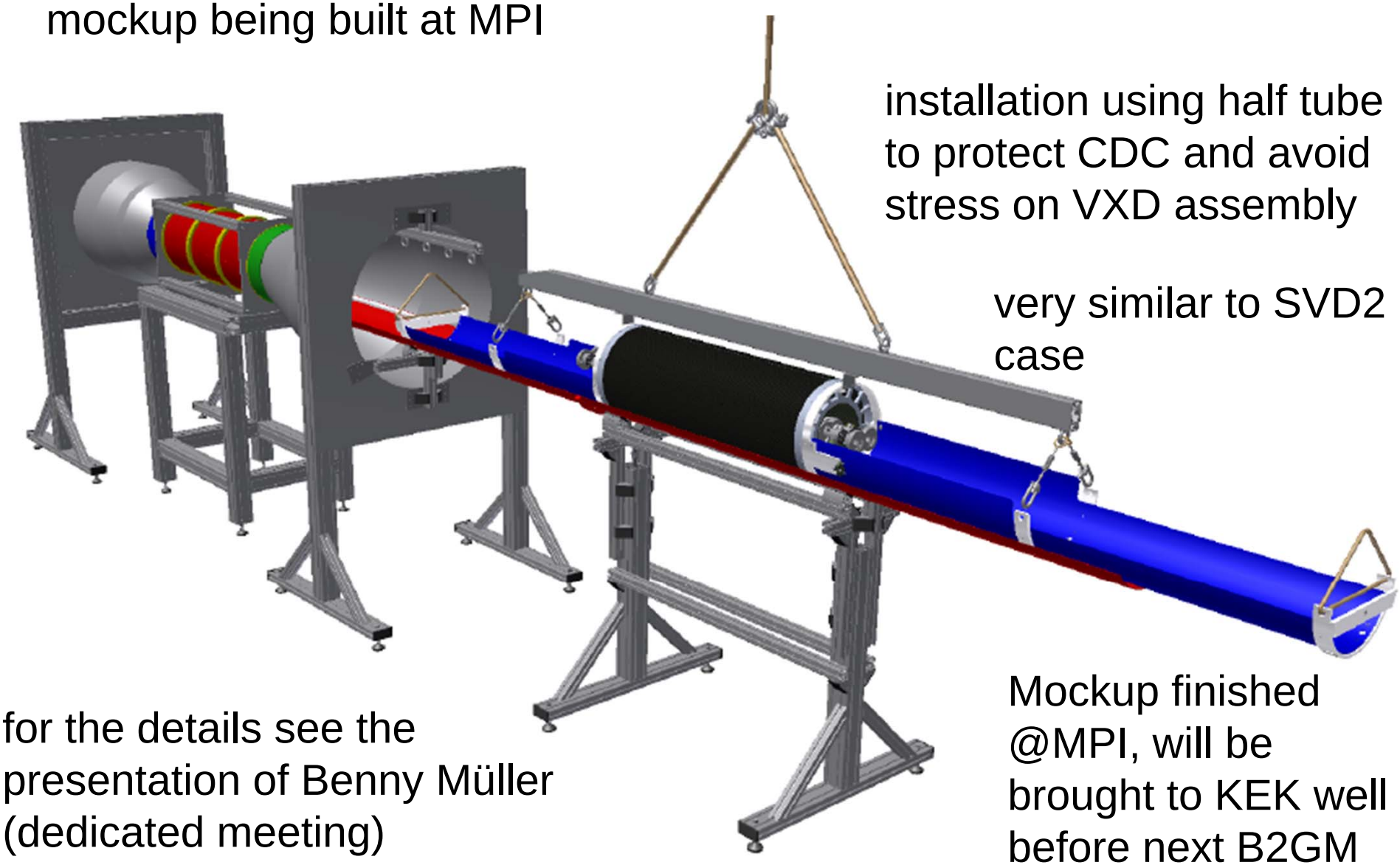
EB recommends to stop Seevogh end of 2013



Decision transferred from IB to EB (money for Seevogh in 2014 available)

Alternative Installation Method (AIM)

Method developed and designed, mockup being built at MPI



installation using half tube to protect CDC and avoid stress on VXD assembly

very similar to SVD2 case

Mockup finished @MPI, will be brought to KEK well before next B2GM

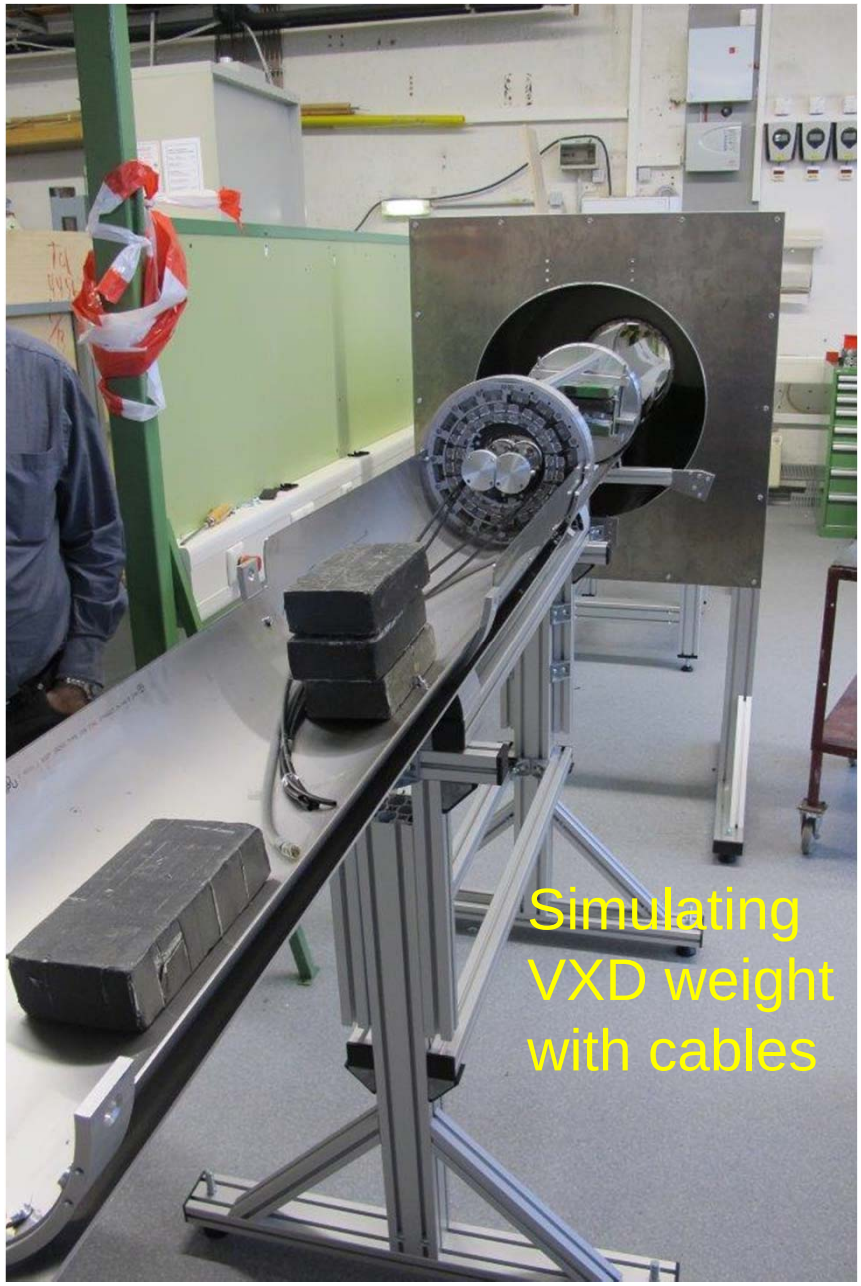
for the details see the presentation of Benny Müller (dedicated meeting)

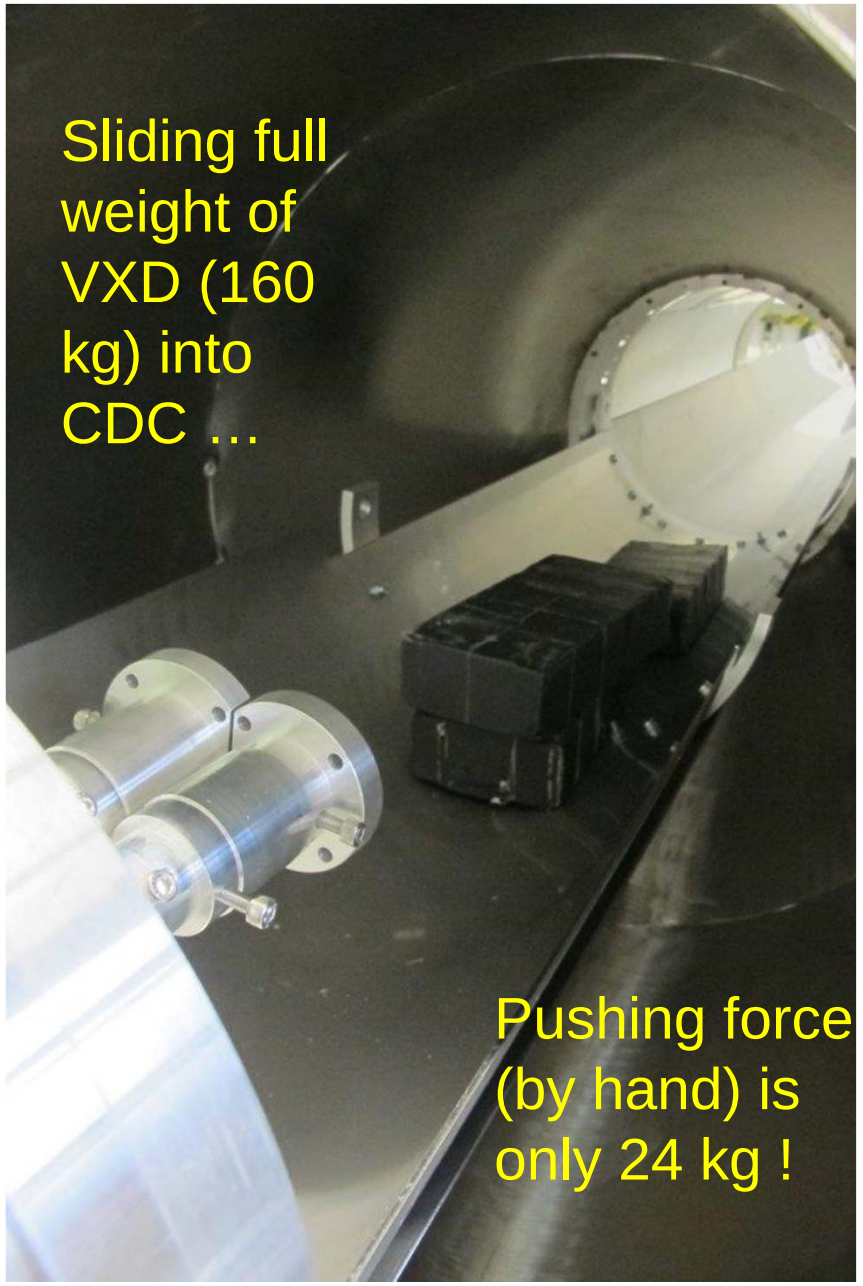
Alternative Installation Method (AIM)

Alternative Installation Method (AIM)

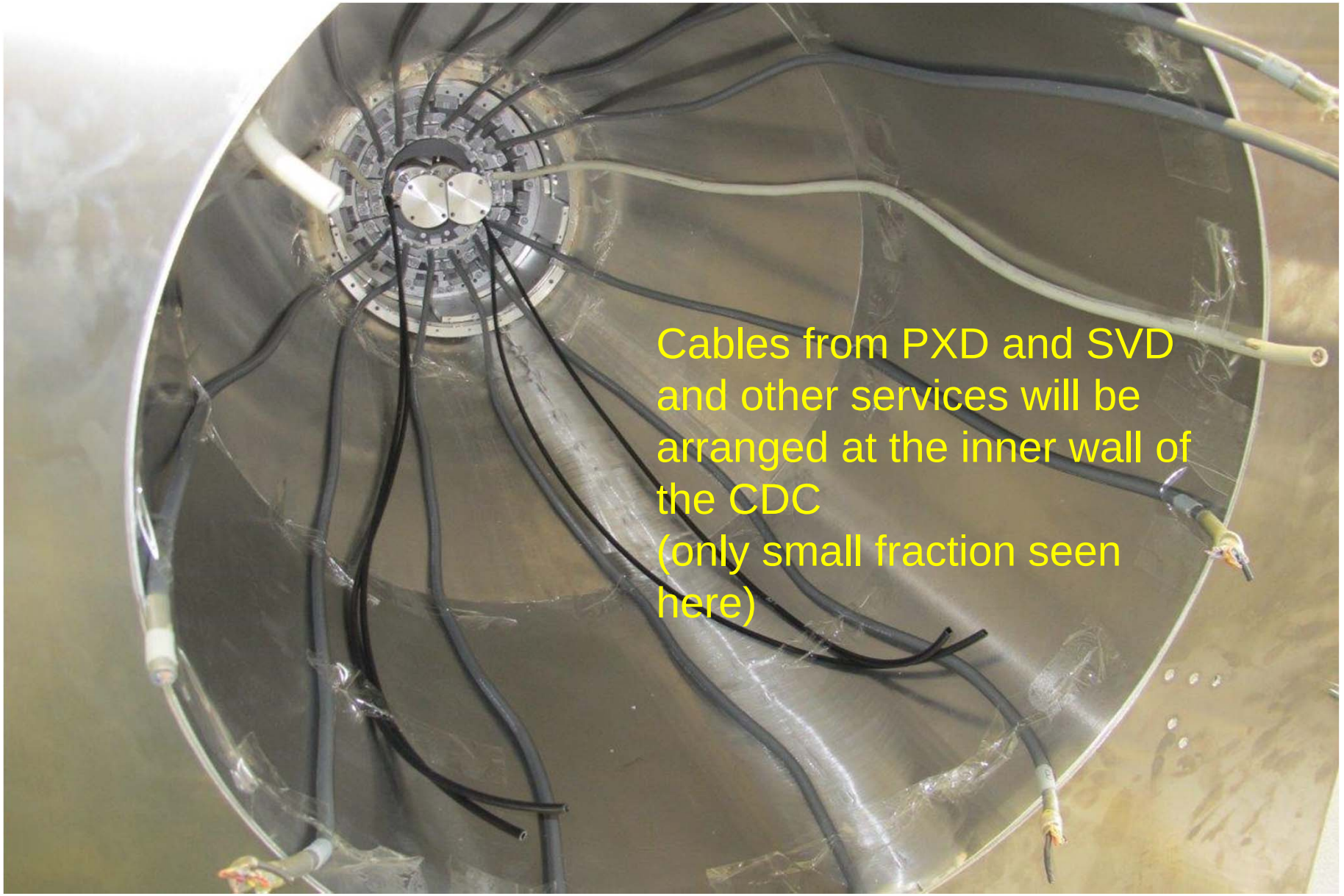
Alternative Installation Method (AIM)

Alternative Installation Method (AIM)

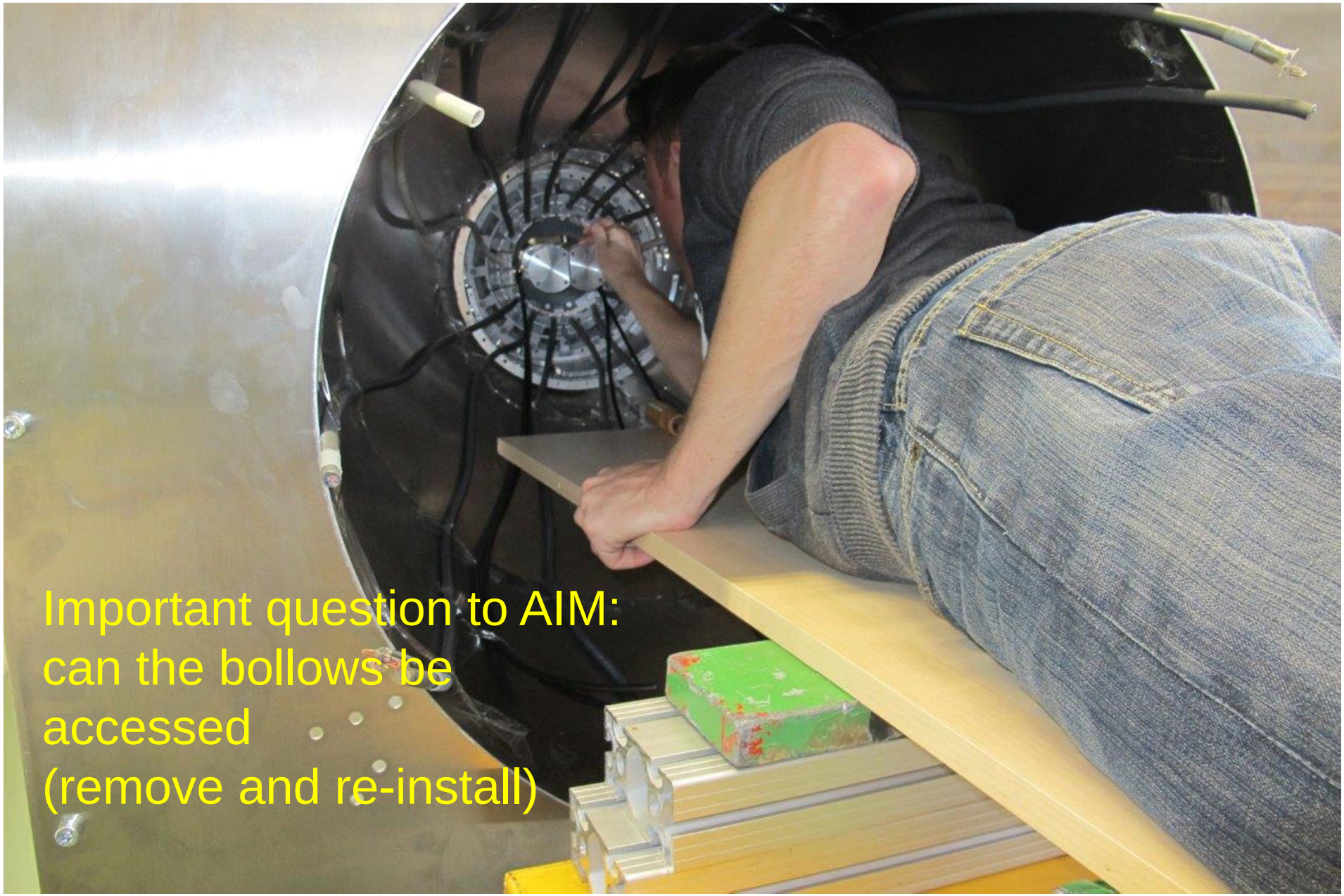




Alternative Installation Method (AIM)



Alternative Installation Method (AIM)



Alternative Installation Method (AIM)

Meeting with KEK Cryo Experts

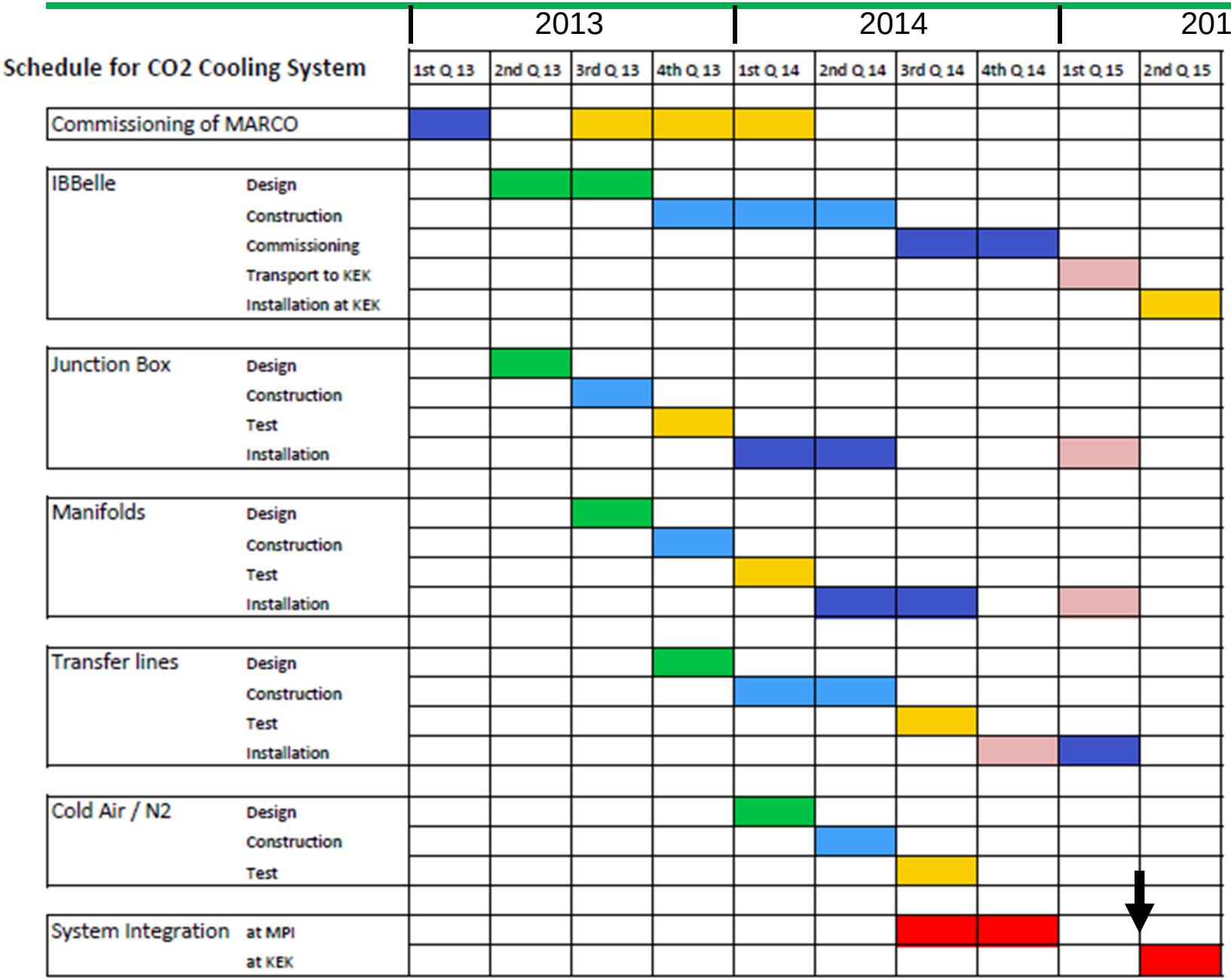
Agreement was reaced that KEK cryo group will service the CO2 plant
Monitoring will be done by Belle II shift crew (call cryo group for service in case of alarm)
MPI / DESY remain responsible for the CO2 system.

Proposal:

Introduction of IBBelle to KEK cryo group during next spring, using the ATLAS version (identical to the Belle II version)
KEK group will consider this option
Further detailed discussion during next B2GM (Feb. 2014)

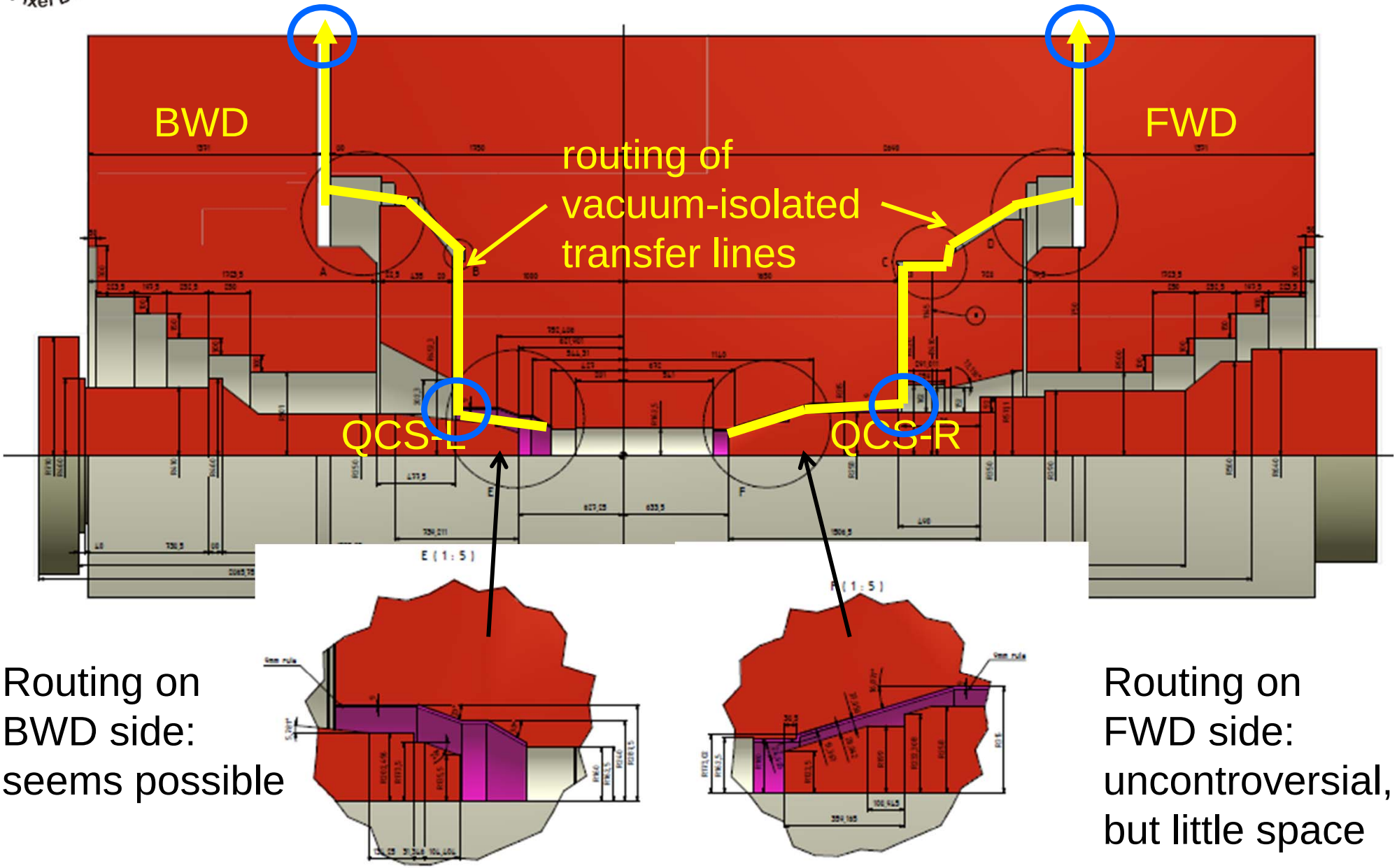
High Pressure Safety:
IBBelle will go through TÜV certification, get into contact with Japanese branch of TÜV to get approved by government‘s safety regulations

Schedule for VXD Cooling Systems



install CO2 System at KEK in April 2015

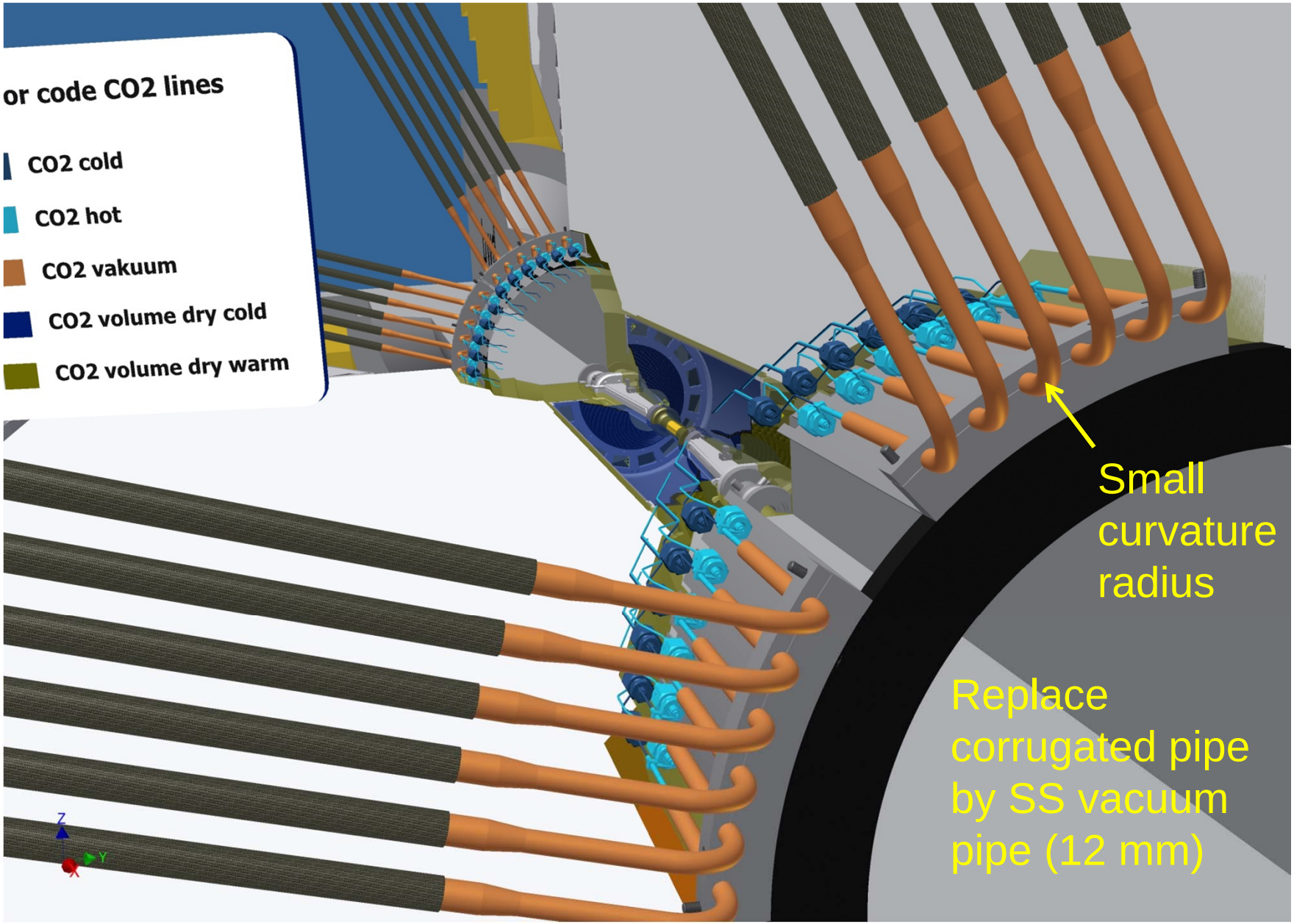
Outer Detector meeting



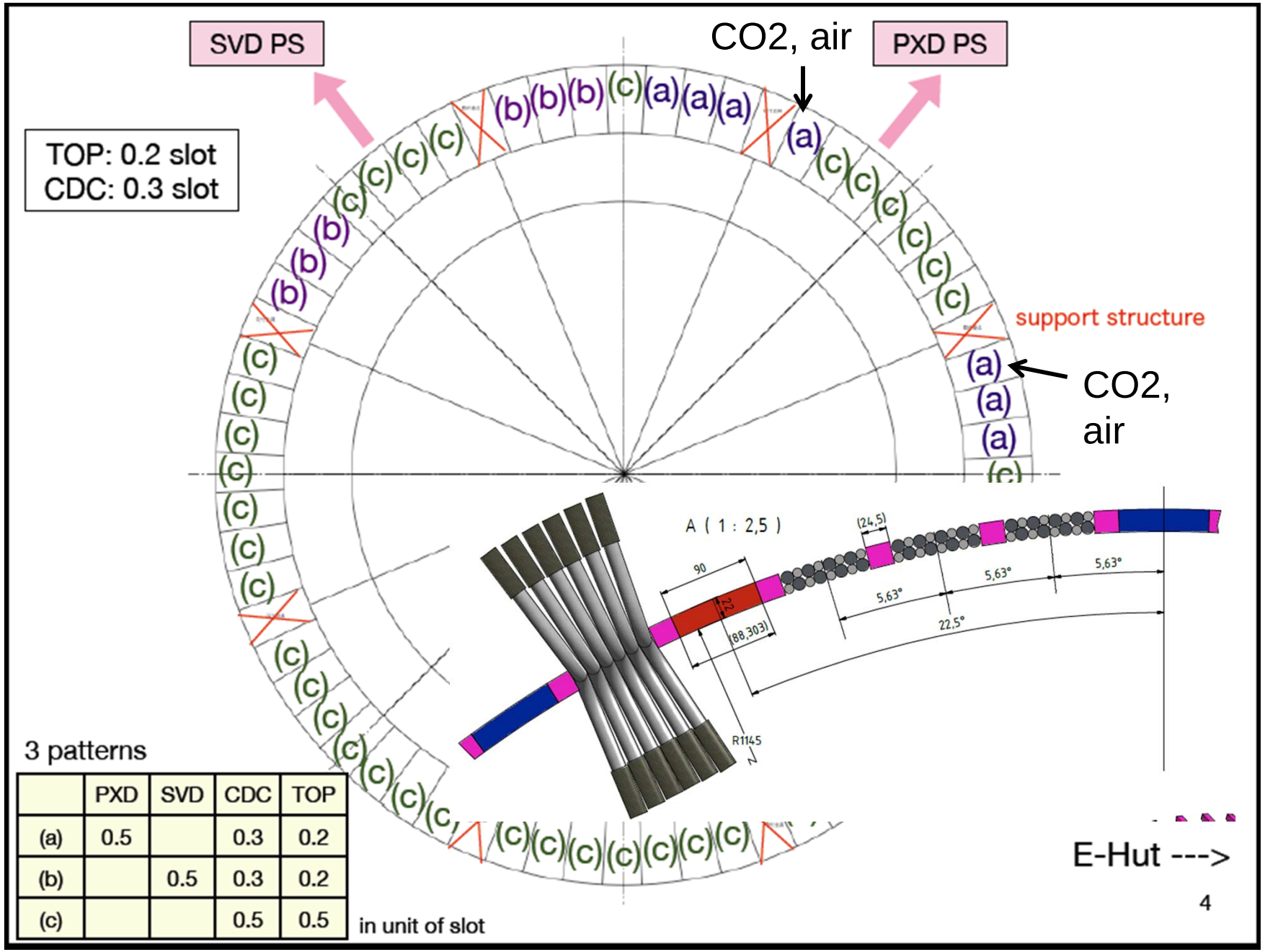
Routing on BWD side: seems possible

Routing on FWD side: uncontroversial, but little space

Transfer Line Routing to VXD



Transfer Line Routing at CDC End plate



3 patterns

	PXD	SVD	CDC	TOP
(a)	0.5		0.3	0.2
(b)		0.5	0.3	0.2
(c)			0.5	0.5

in unit of slot

Conclusions from Satellite meetings

Outer Detector:

CO2 flex lines are considered as acceptable for the routing over the CDC end plate

CDC does not like our schedule for the installation of the CO2 lines (no access to CDC electronics during this work):

But: Need to install system for the BEAST II phase

RVC / AIM installation:

MPI will finish design by adding AIM de-installation and emergency de-installation (in case RVC does not open)

All steps will be documented before next B2GM (final decision)
Mockup will be visited by KEK members (and later be brought to KEK)