

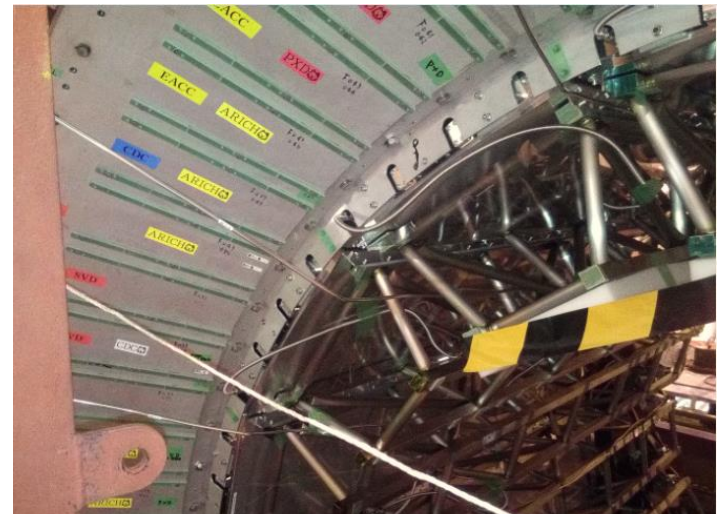
# IR status

S. Tanaka (KEK)

20<sup>th</sup> International Workshop on DEPFET Detectors and  
Applications

# KEK status

- SuperKEKB
  - Phase 1 beam operation is stably ongoing.
  - ~600mA storing in each ring has achieved
    - which is comparable with expectation (2 month for storing 0.5-1 A)
  - From this July, IR phase1 setup will be dismantled
- Belle II
  - TOP installation is ongoing (will be finished in 1<sup>st</sup> week June)
  - Magnetic field measurement is schedule after TOP installation
  - CDC installation will start from this Aug until Sep.
  - The Endcap installation schedule is not confirmed yet.



# Phase 1 status

# Preparation for BEAST study in May

- Touschek study
  - Emittance control knobs for LER/HER
  - Bunch-current scan (change fill pattern?)
- Beam-gas study
  - Vacuum bump
- Collimator study
  - Collimator control panels, new fiber loss monitors, etc.

May 16<sup>th</sup> : Touschek LER

May 17<sup>th</sup> : Touschek HER

May 18<sup>th</sup> : Touschek backup

May 23<sup>th</sup> : Vacuum LER

May 24<sup>th</sup> : Vacuum HER

May 25<sup>th</sup> : Vacuum backup

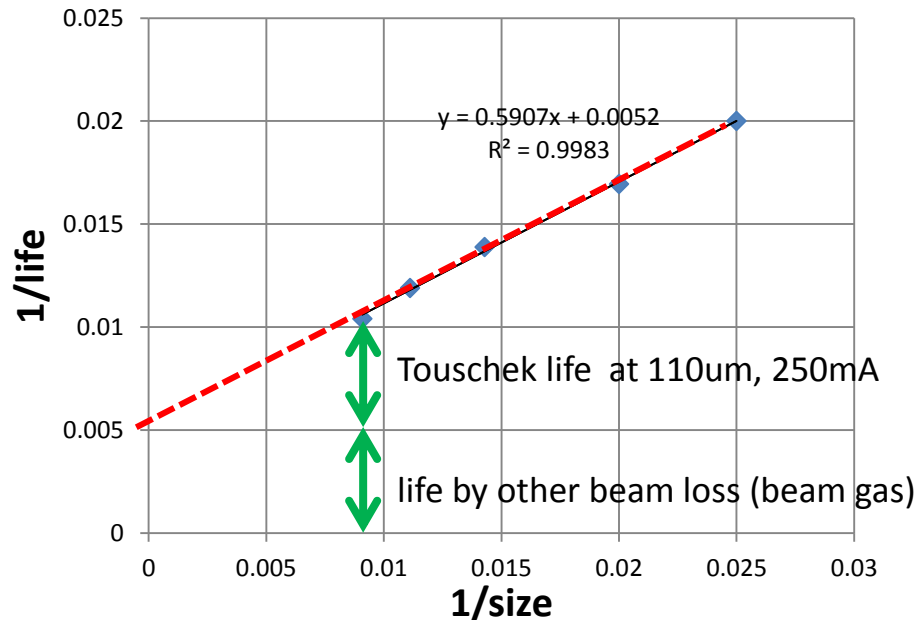
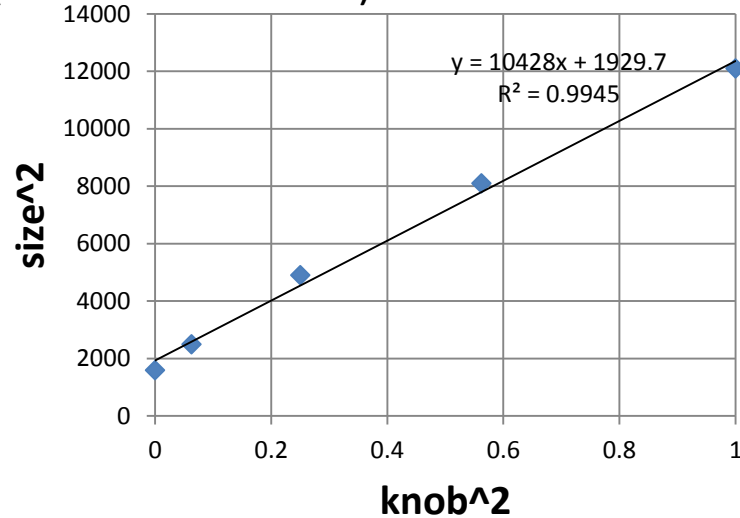
# LER beam-size scan

Nakayama

Apr. 5<sup>th</sup>, 15:13-15:32,  $I = \sim 250\text{mA}$

Emittance Control Knob(ECK) is ready  
(thx to Ohnishi-san)

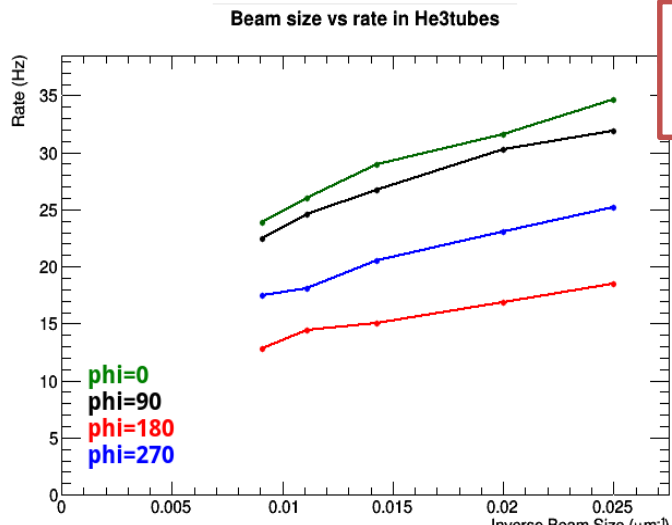
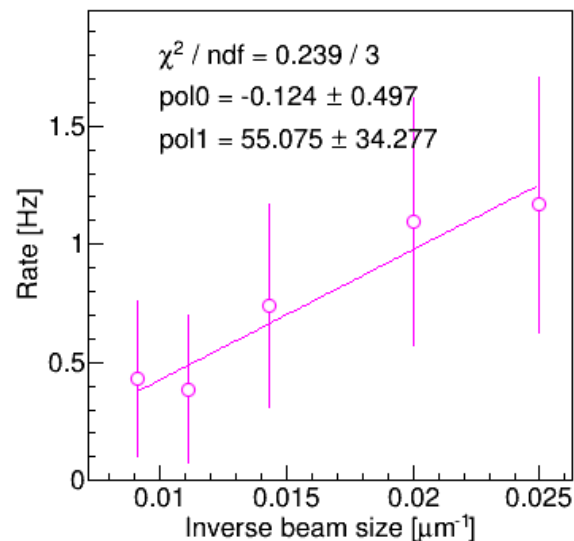
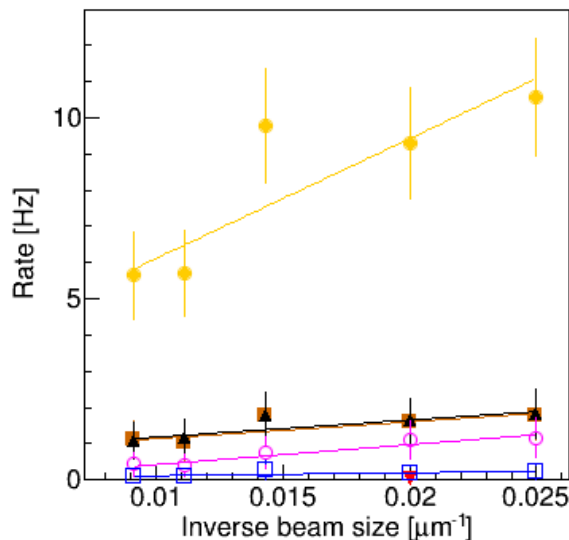
knob	Beam size (um)	life (min)
1	110	96
0.75	90	84
0.5	70	72
0.25	50	59
0	40	50



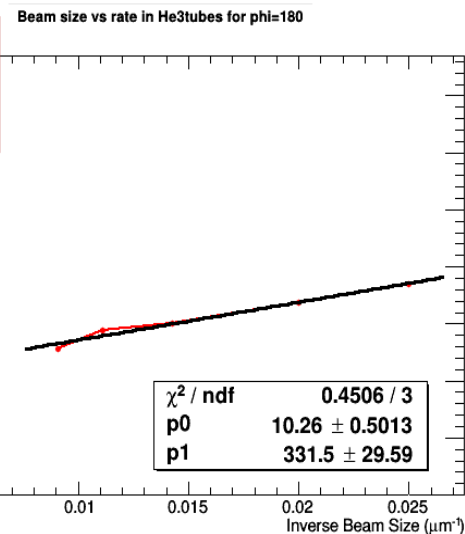
Touschek life and  
beam-gas life is  
comparable now.

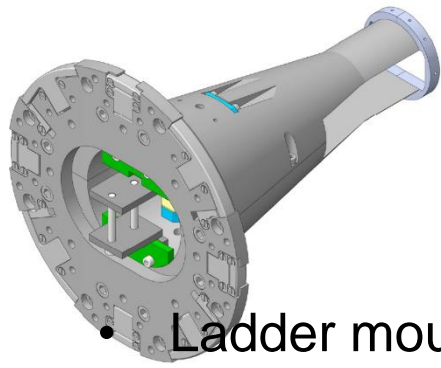
# BEAST BG vs. 1/size

TPC (fast neutrons)



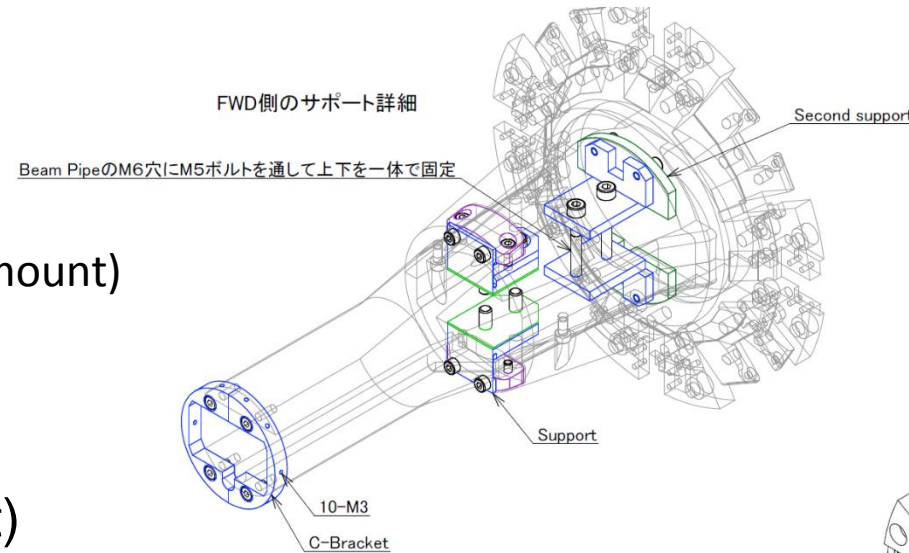
He3 (thermal neutrons)



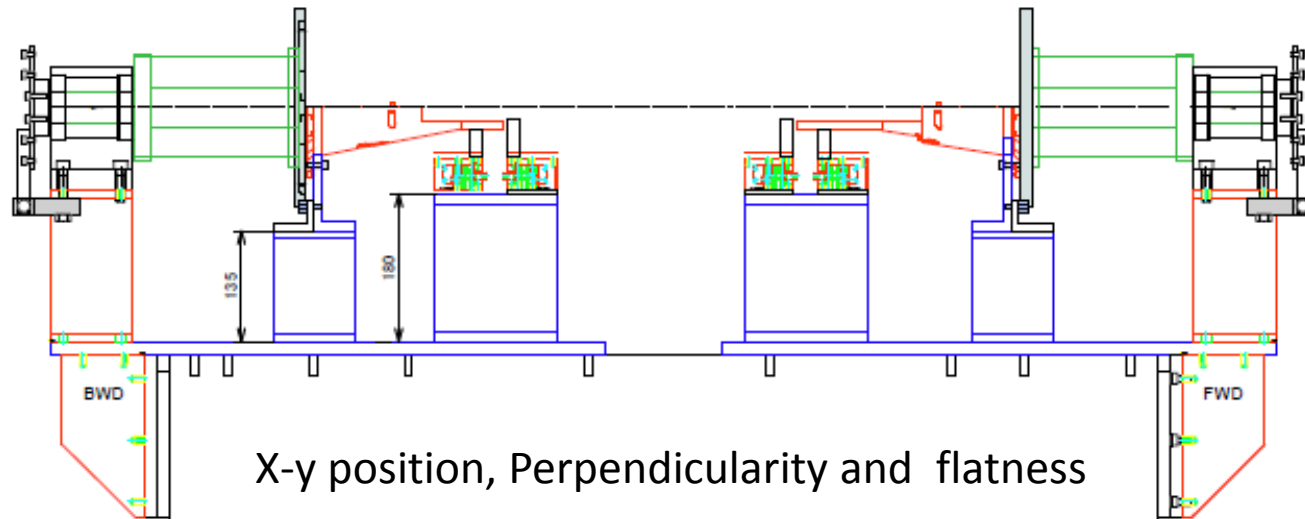
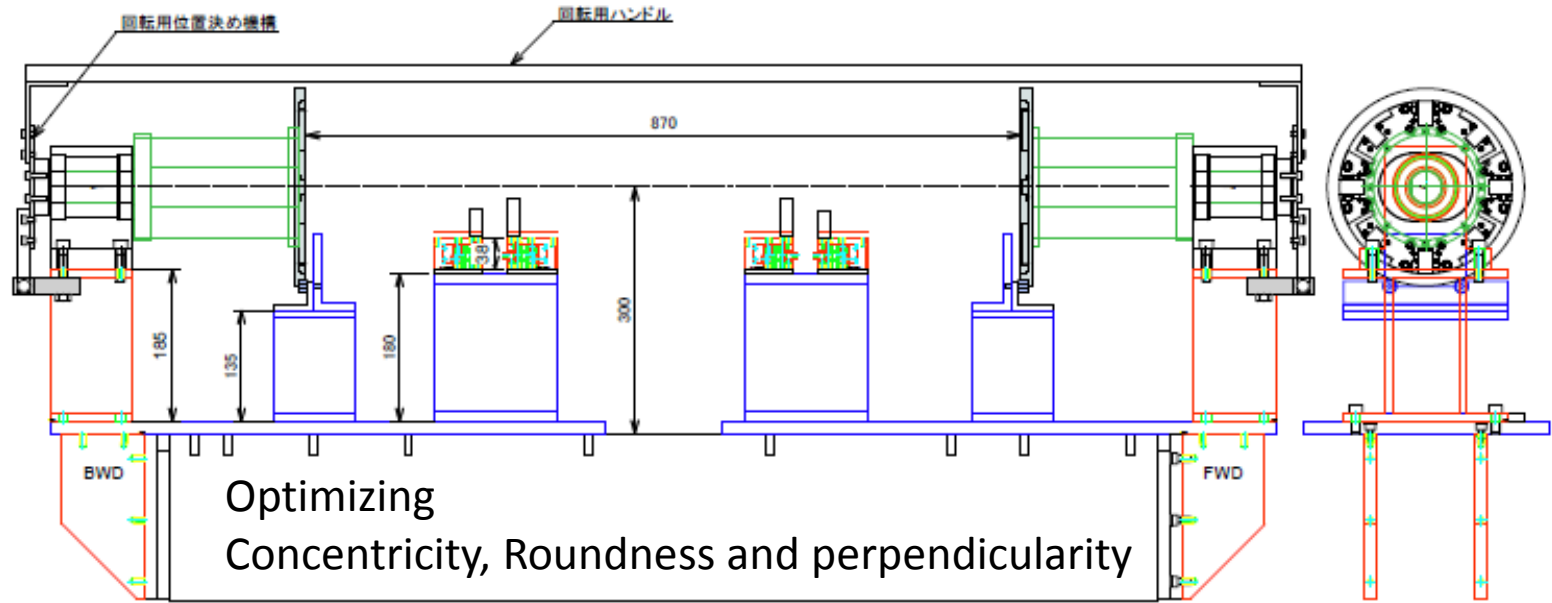


# KEK VXD status

- Ladder mount table preparation
  - Mount arm
  - Keratherm mount (Origami pipe mount)
  - 3D measurement tool
  - Thermal dry volume
- Outer cover gluing test(second test)
  - Finished in last week
- Almost VXD assembly procedure has agreed in last B2GM
  - Blushing up of each connection procedure and developing tool for service management are necessary
    - i.e. Alignment of PXD mount block, cable management
- Updating bracket design (BP+HM)
  - on production
- (Issue)Support jig on 180 degree rotation (for PXD mount)
  - Special outer cover (as an option)

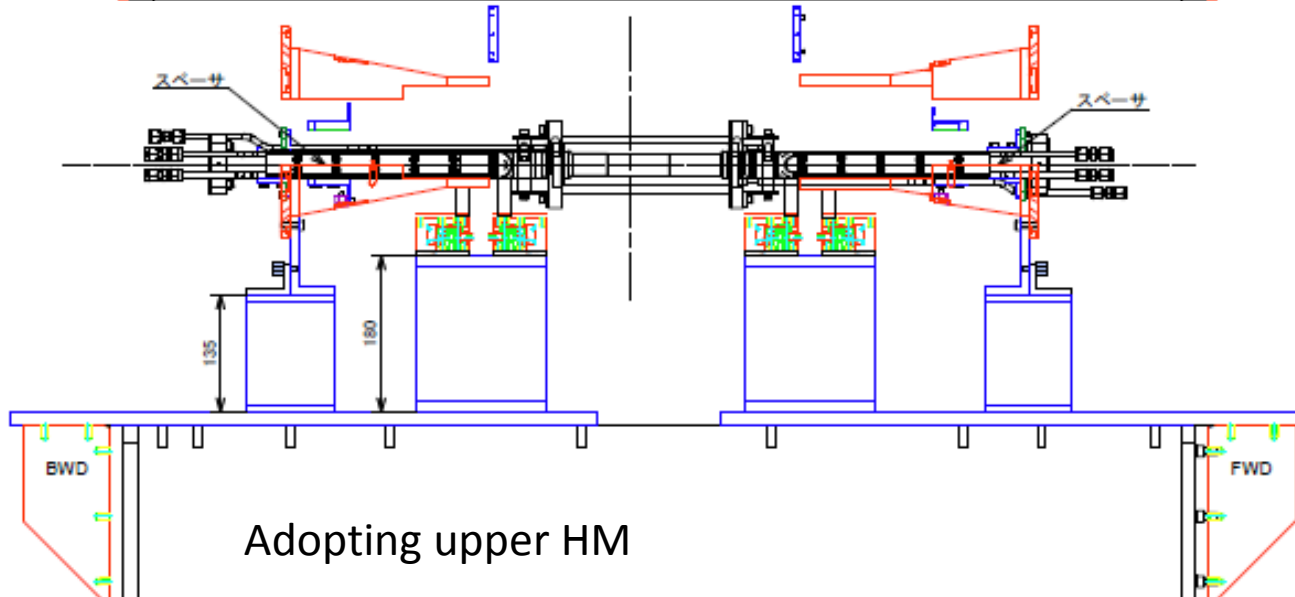
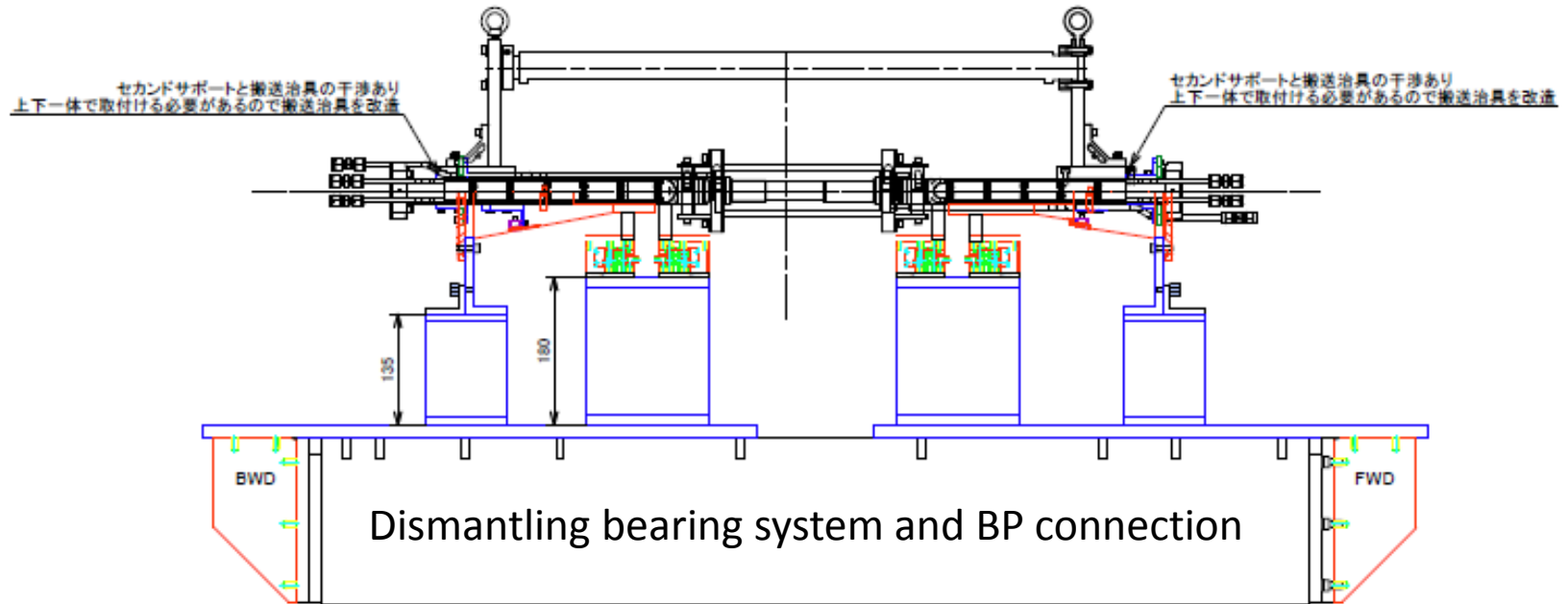


# VXD assembly

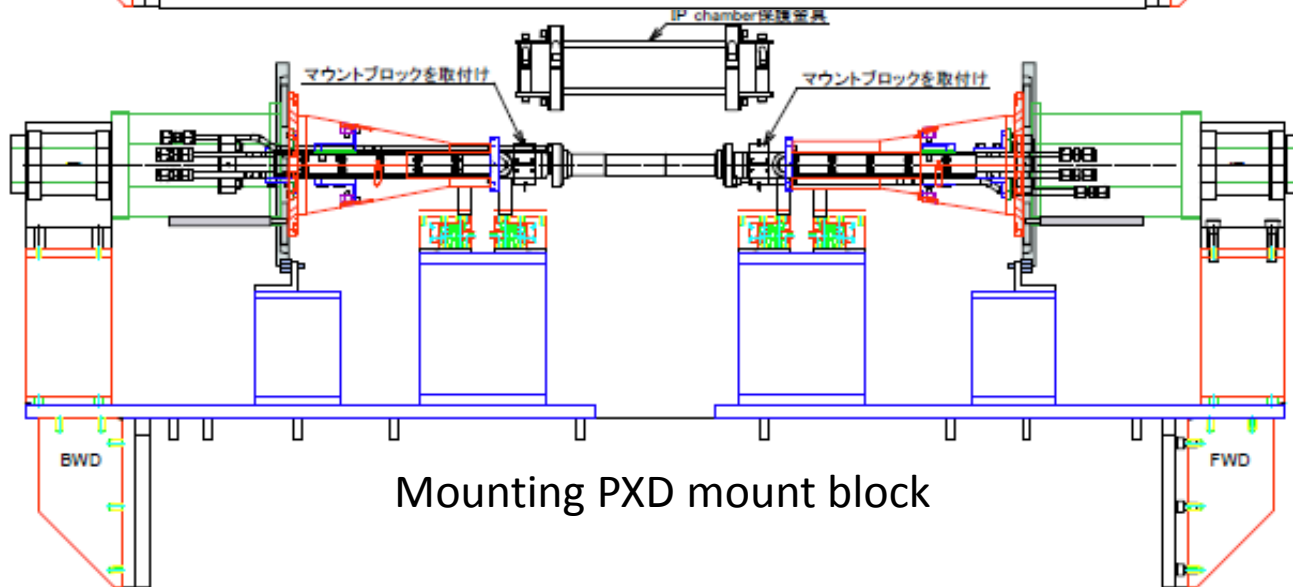
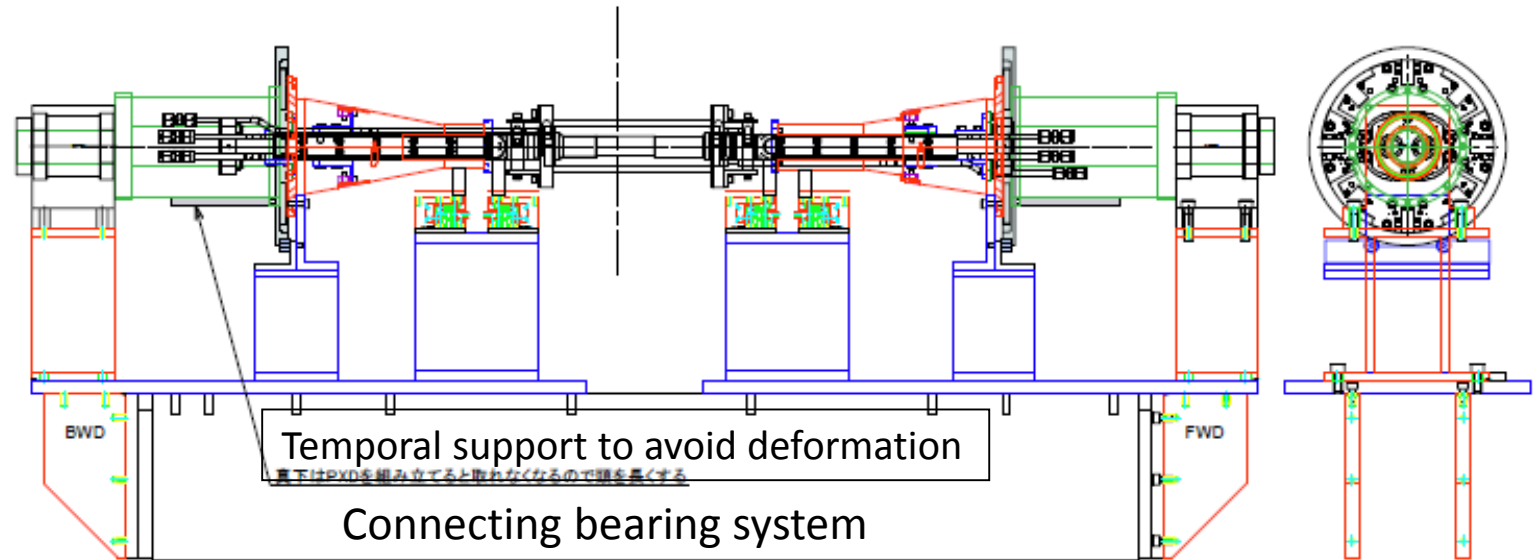




# VXD assembly



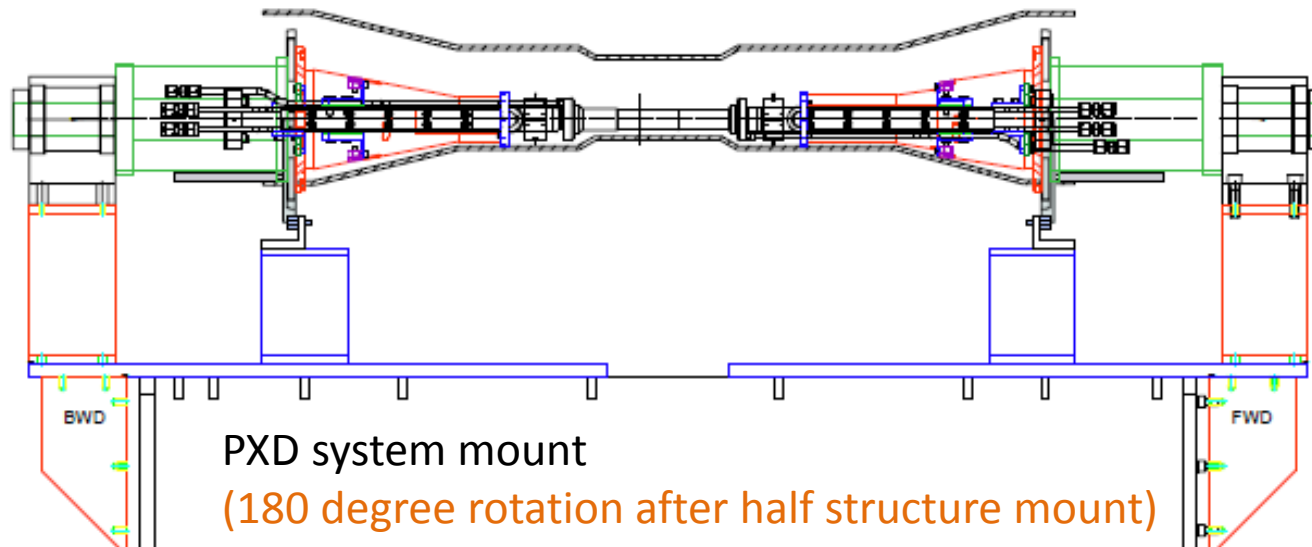
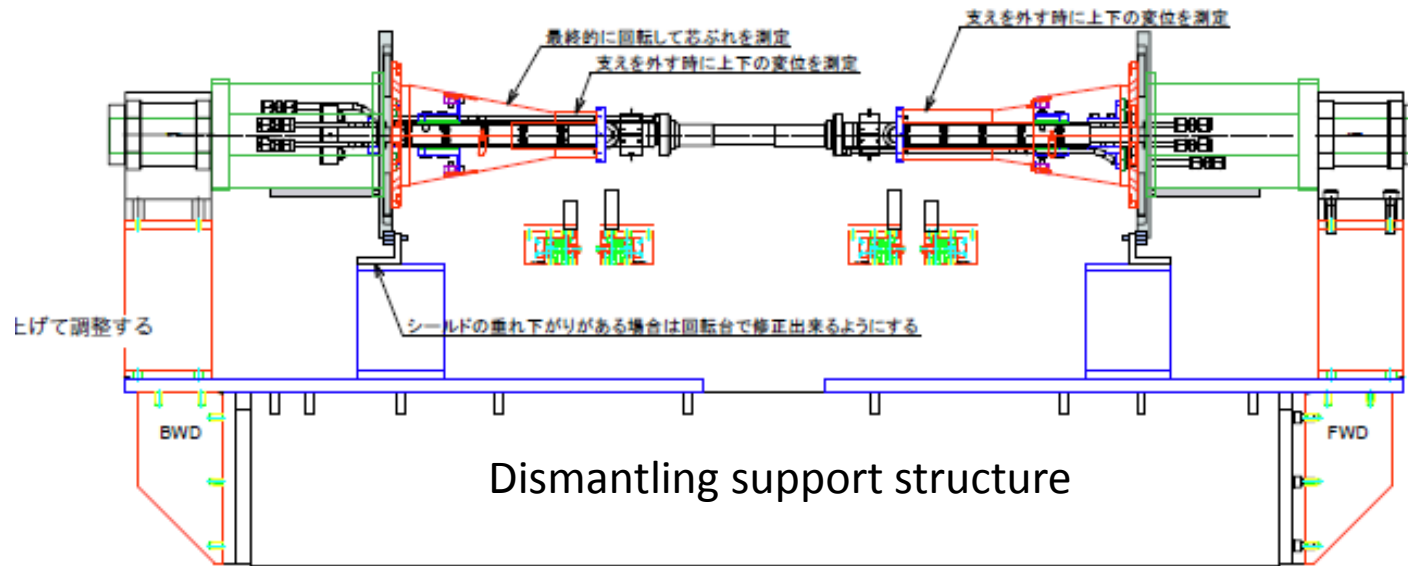
# VXD assembly



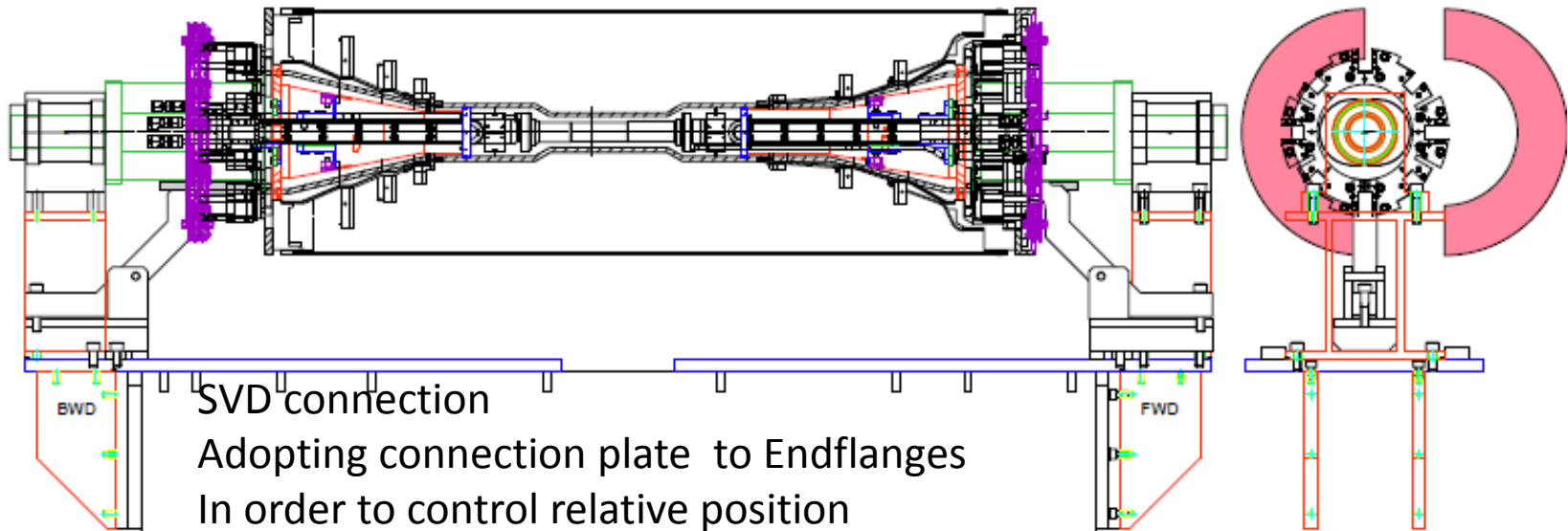
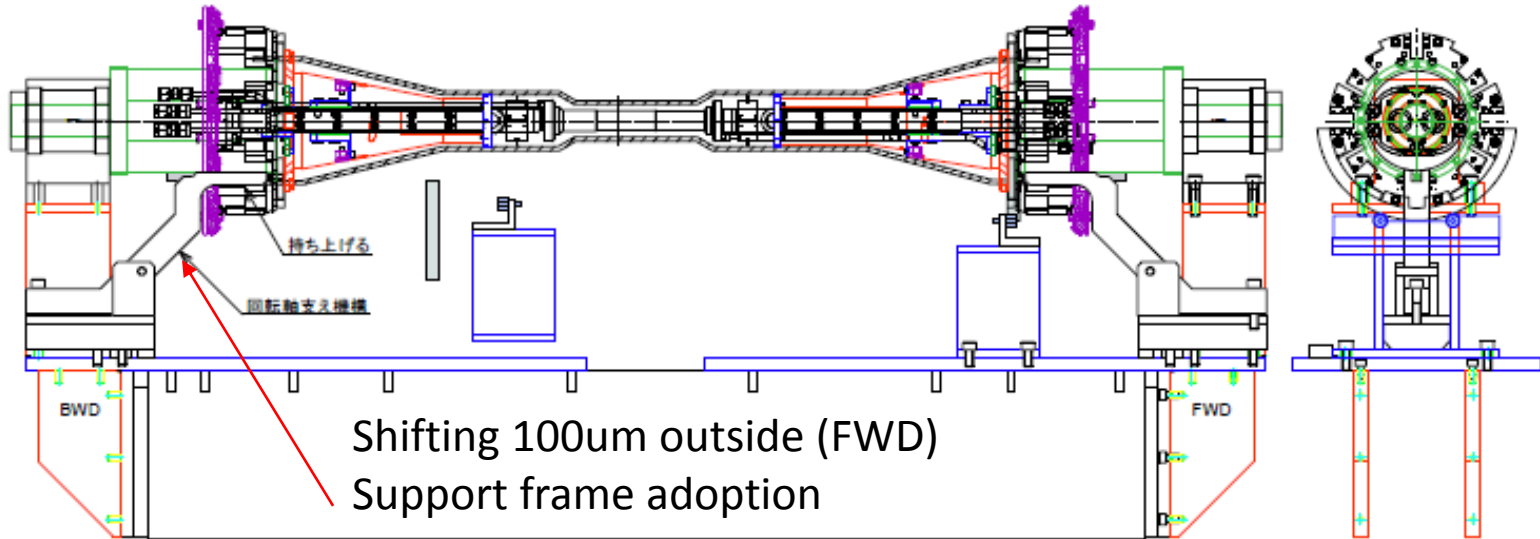
Alignment jig  
By Tscharlle



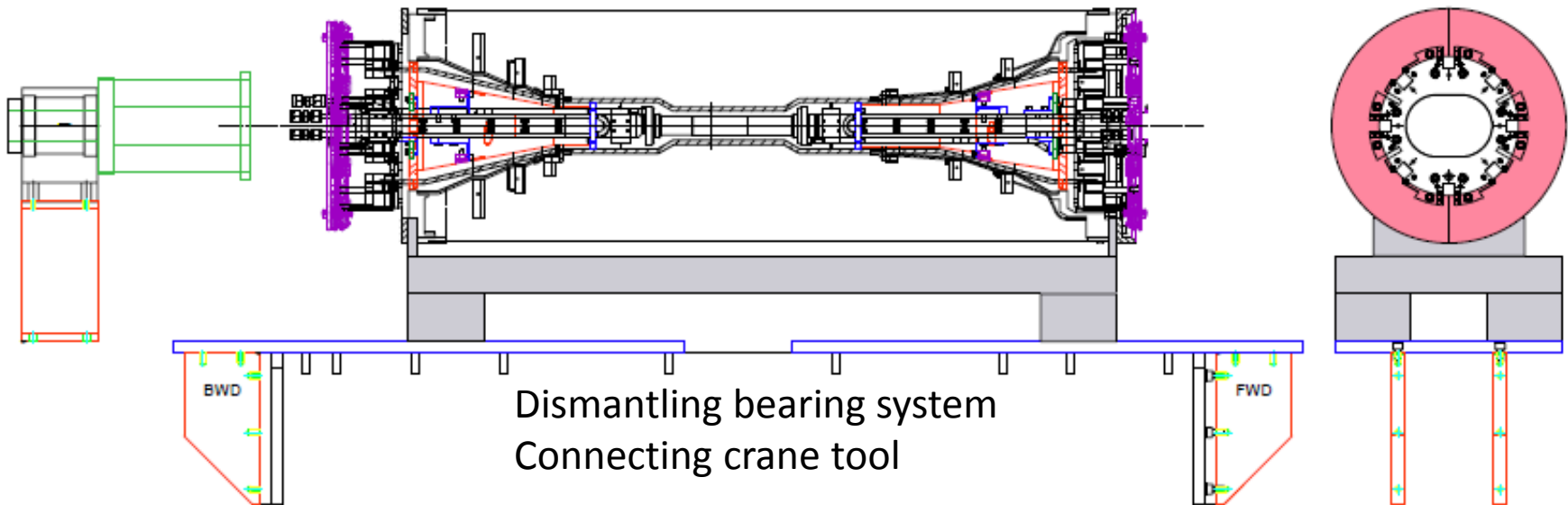
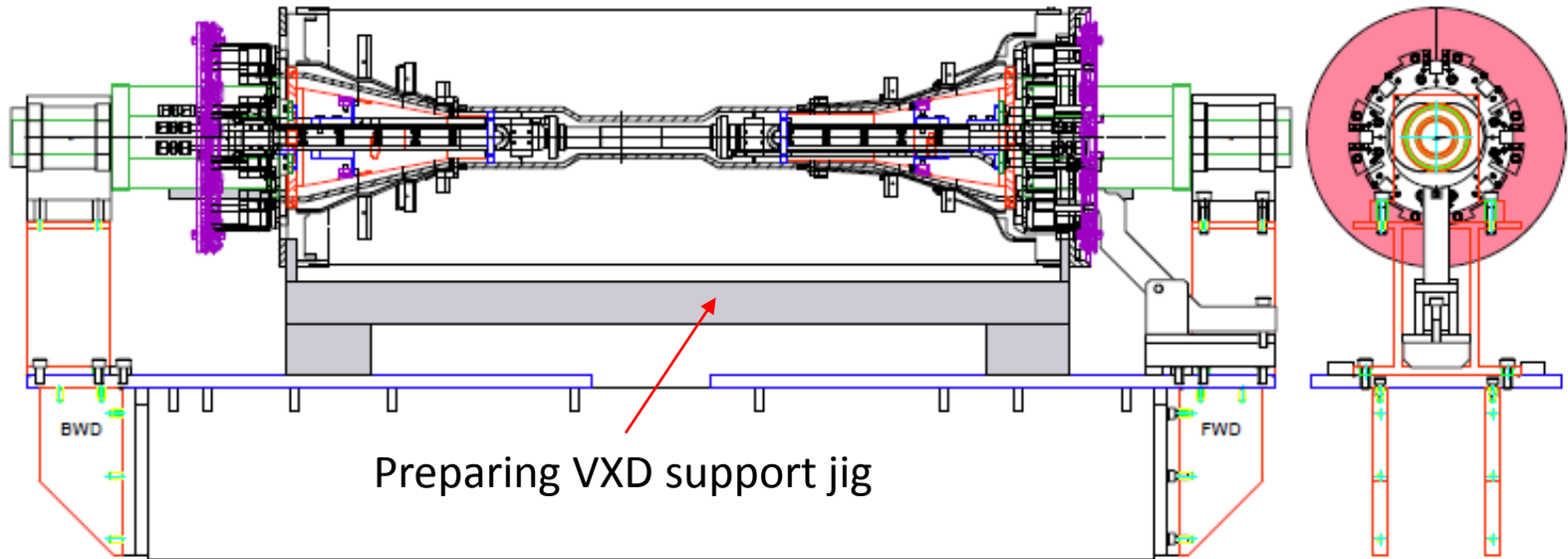
# VXD assembly



# VXD assembly



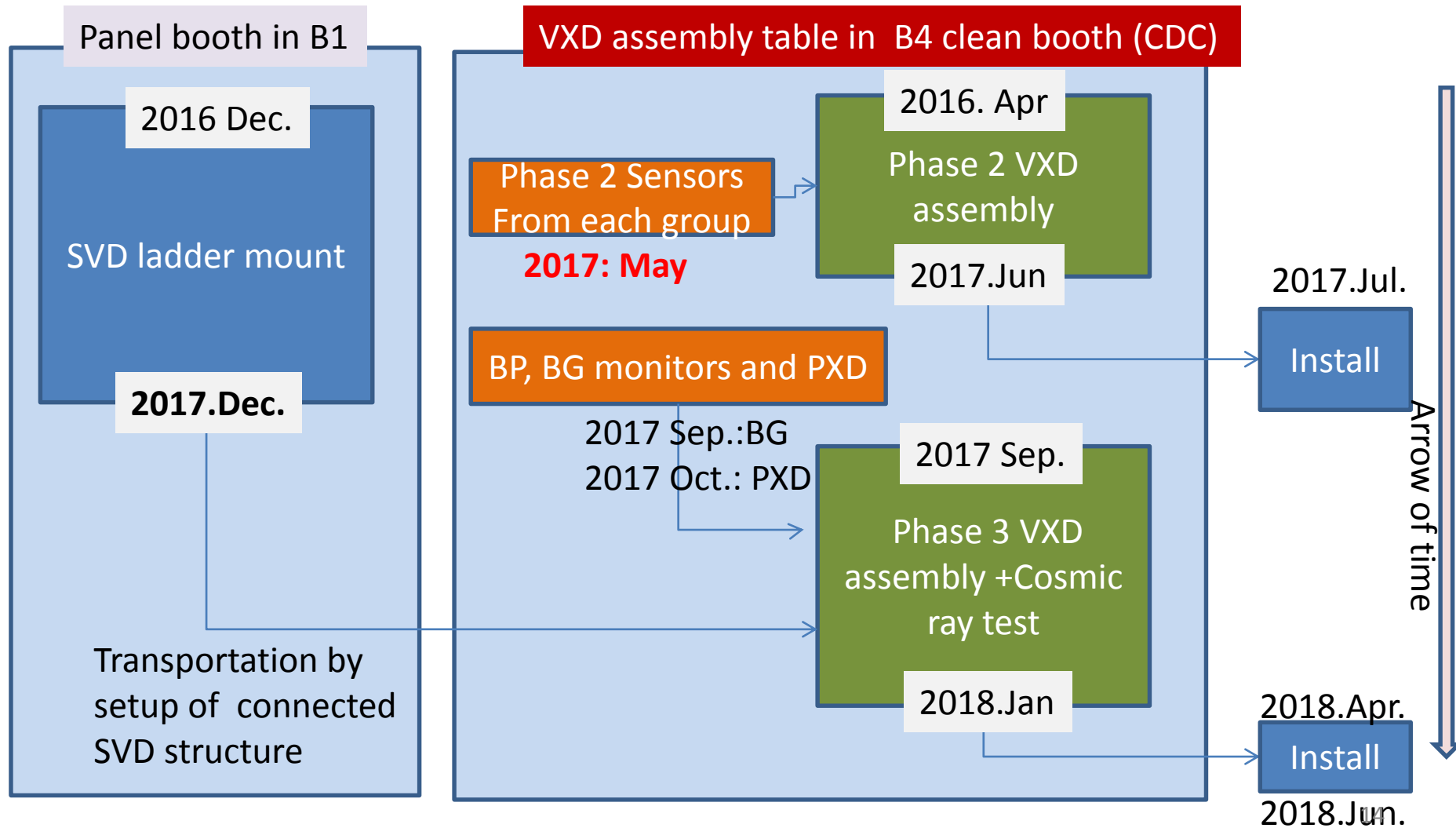
# VXD assembly



# Assembly work management

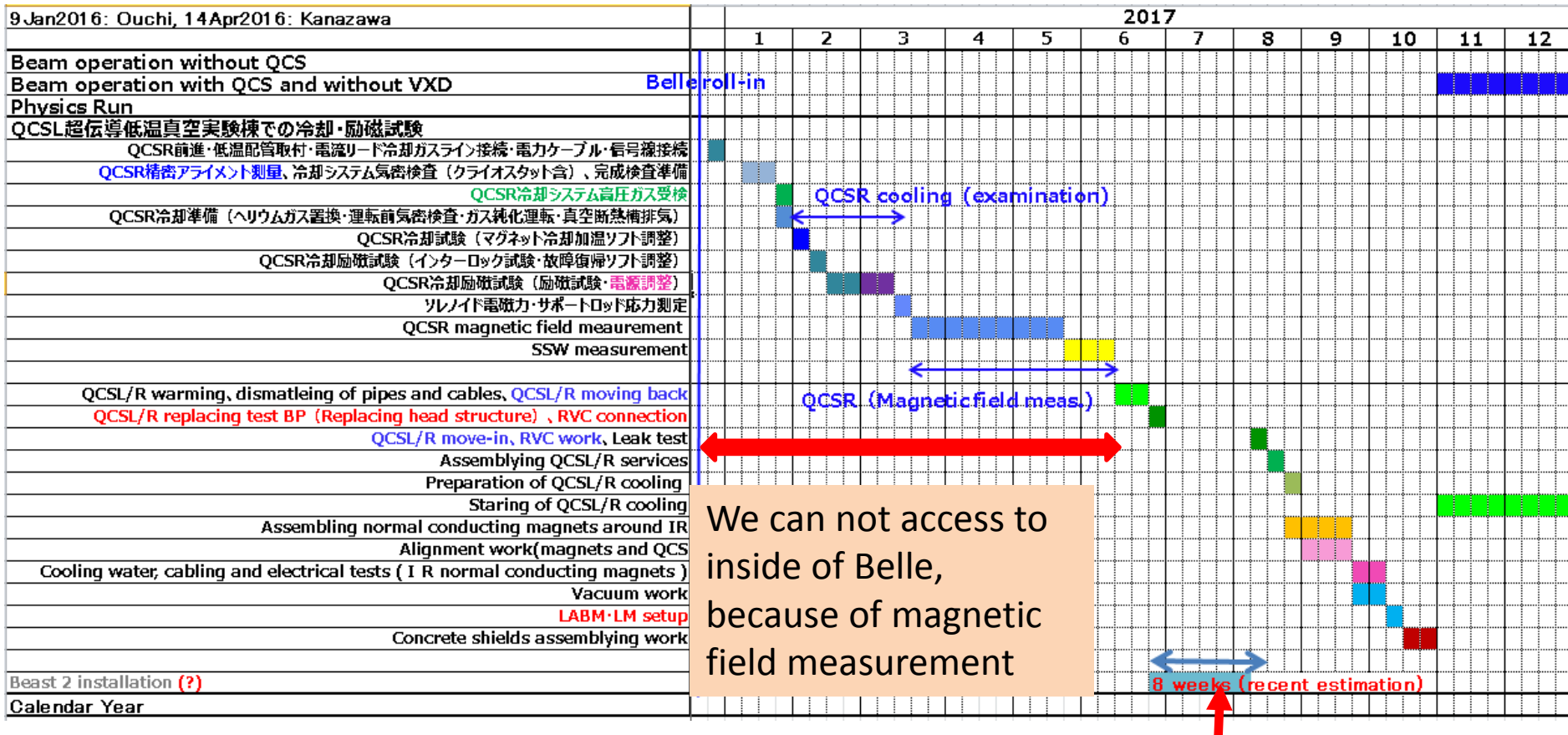
- We will assemble two sets of VXD system
  - VXD for BEAST phase II
  - VXD for physics run

Updated in last B2GM



# Machine group schedule in 2017

- From Phase 1 to phase 2



We can not access to inside of Belle, because of magnetic field measurement

After Belle rolled-in, we can not access to CDC area.

We have to check/verify all of VXD installation work in this year.

# Steps until installation

~March (2016)

CO2 transfer tube, End-flanges for phase 3, Updated BP mock

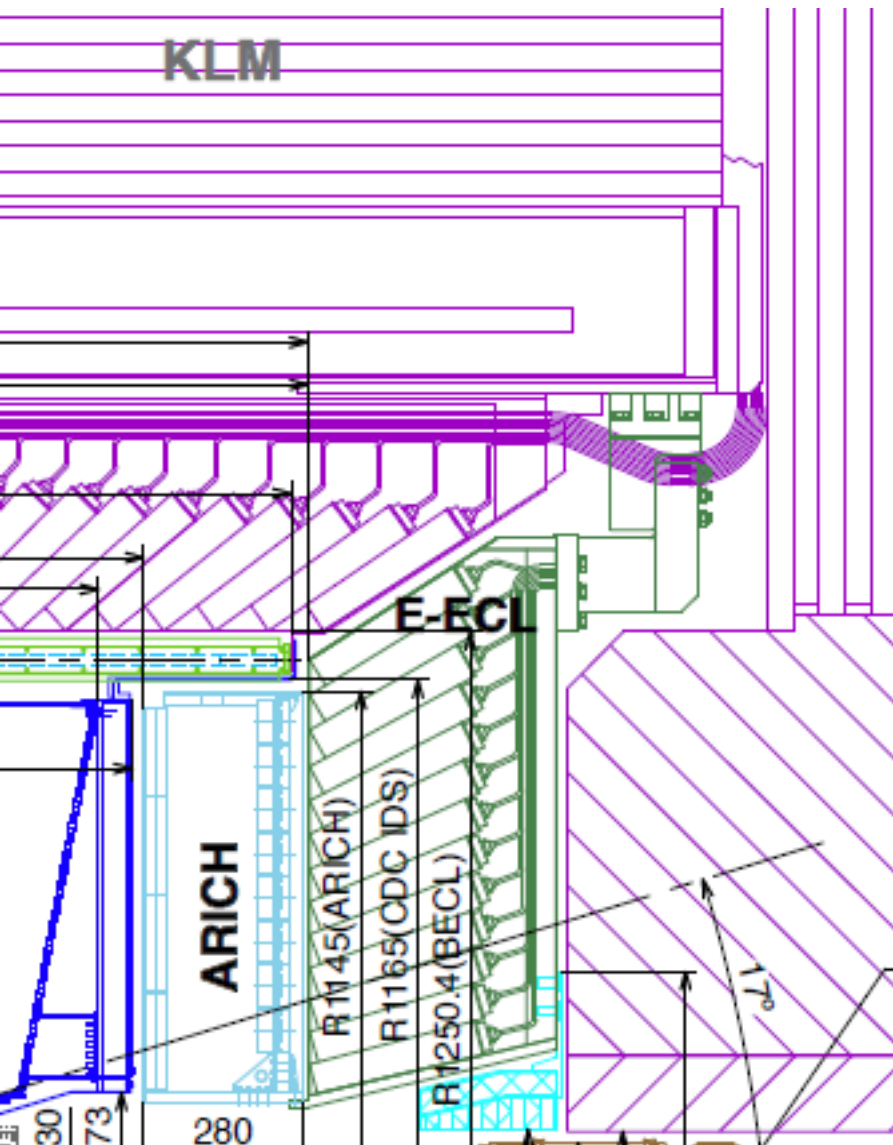
IP chamber for phase 3, Al sheet gluing on outer cover... (almost sub-component have prepared)

- Special meeting for service design around Dock area (MPI)
- (Apr.-) VXD assembly exercise
  - As a first step, alignment work : (Updating jig design is finished)
- (May) VXD installation discussion at MPI
- 24<sup>th</sup> B2GM (18<sup>th</sup> -19<sup>th</sup> Jun. Gemba discussion)
  - PXD /BEAST mount test (final confirmation)
  - BEAST sensor + services mount
  - VXD assembly discussion
  - Space check for service work(brackets/scaffoldings)
- (Around Aug-Sep.) IBelle commissioning at Tsukuba hall is started
  - Junction box/ manifold installation, continuously
- 25<sup>th</sup> B2GM
  - CO2 piping until Dock area (after CDC installation)
    - Remaining only piping work from sensors to Dock after VXD installation
  - B4 assembly space preparation (after CDC installation)
- (~Nov.)Beam pipe for phase 3 will delivered
  - Test VXD installation @ roll-out position (not decided)
- (2017 Jan. ) Phase VXD : ready for start sensor assembly
- (May 2017) BEAST/SVD/PXD systems for phase 2 : ready for assembly
- (July 2017) VXD installation test -> VXD installation



# Screw connection for cabling

18<sup>th</sup> Jun. Gemba meeting



# VXD installation steps

- All of piping work from VXD docks to outside: Oct. 2016- (until Dec.)
- Cabling work from VXD dock to each system: end of June 2017~
- Preparing VXD installation setup: end of June 2017~
- RVC connection to QCS(@parking position): end of June 2017

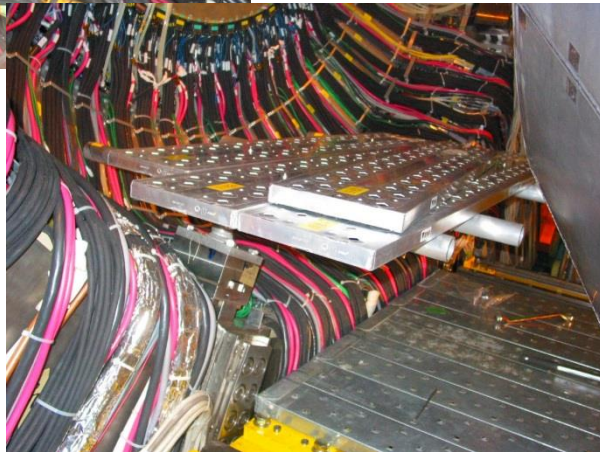
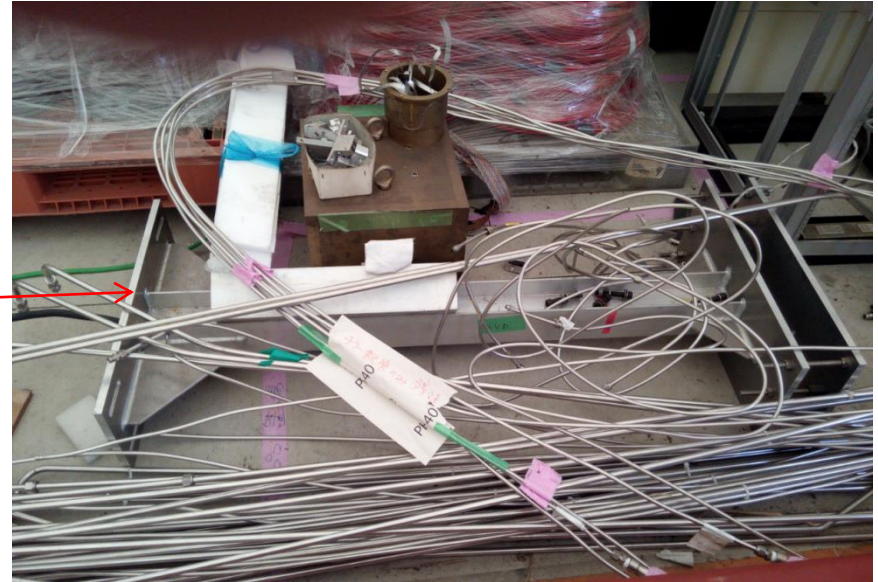
- (After finishing VXD cabling work)

Is it enough Manpower?  
(who should know each procedure)

- VXD installation (*detailed story will be shown by David*)
- Service connection from VXD to each Docks
- Bellows pipe connection (feasibility check is necessary)
- Water cooling pipe and BPM cabling work (connection point has agreed with machine group)
- QCS moving in (RVC connection)
- Gap sensor adoption (space allocation has agreed)
  - Detail space allocation is on discussion (BWD).
- Adopting EPDM foam (dry volume)



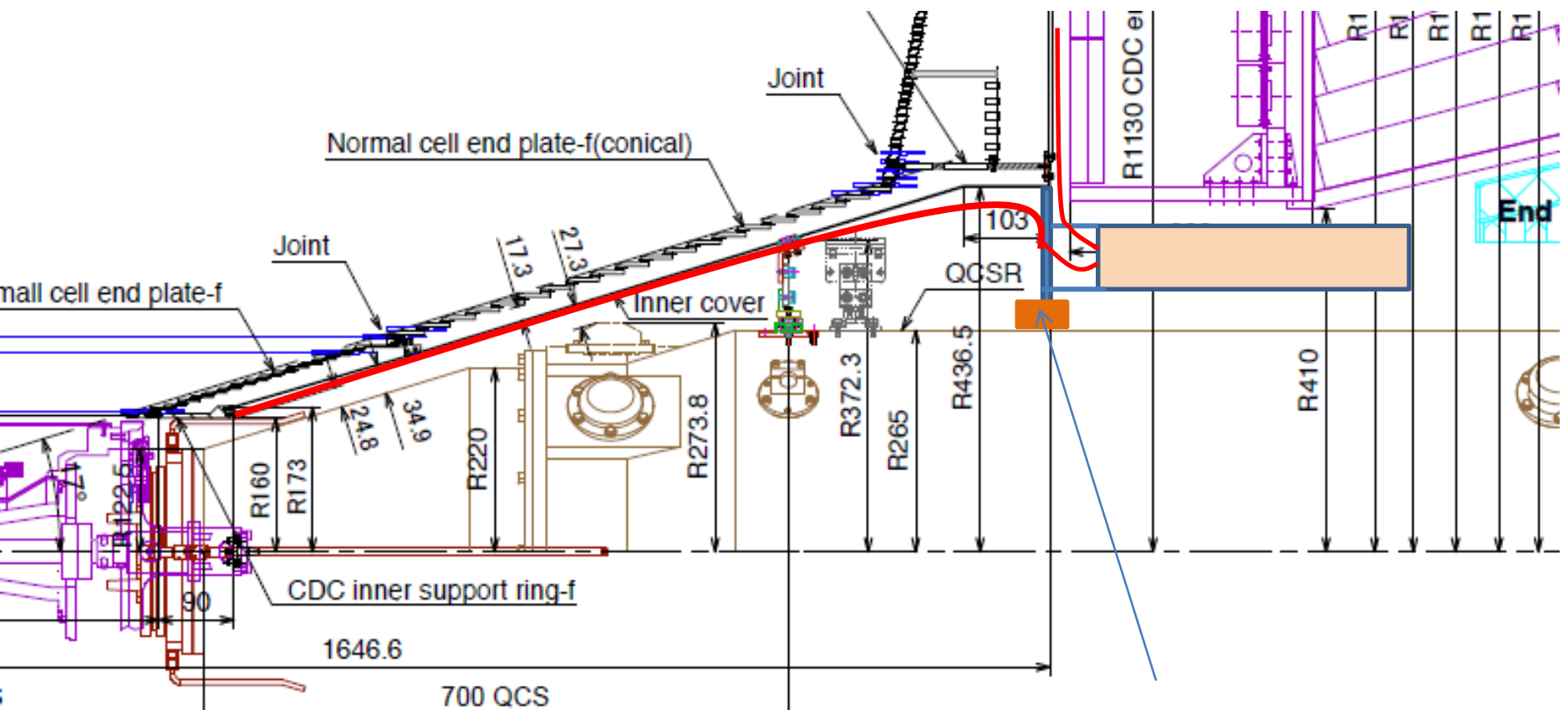
# Checking availability of installation jigs



# Conclusion

- VXD assembly schedule has decided in Feb. B2GM
- VXD activities at KEK in this year
  - SVD ladder mount (review just before next B2GM)
  - VXD assembly work (other than sensor system)
  - IBBelle commissioning with IBBelle team
  - VXD piping work (CO<sub>2</sub>, N<sub>2</sub>, Water, paraffin, sniffing)
- In June B2GM
  - Belle Gemba discussion 18-19<sup>th</sup> for service work
    - No access chance into Belle in this B2GM period (outside is OK)
  - VXD assembly in B1 room
- Oct. B2GM
  - Final chance to access inside of Belle detector before VXD installation
    - (before Belle roll-in to be exact)
  - Piping work until VXD dock

Thank you



EPDM foam for warm dry volume

Detailed service design is mainly in ongoing by Tscharlie and Florian.



# VXD installation



- Mechanics
  - Crane tool: delivered to KEK
  - VXD mounting tube : production done
  - VXD installation ring(connecting to CDC) : design finished
  - RVC remote/ EDI Rod and bracket design on QCS: not yet (should start soon)
  - Cable Cage structure design in the CDC
    - Higher priority issue (FWD) (David, Tscharlie:MPI)
  - Mounting tube is supported by Dock ring on VXD installation
- Plan of Installation test
  - May@MPI (to confirm whole installation procedure)
  - June@KEK (to confirm mechanical stability by mock-up with real outer material)