



Integration: P42 line and SHiP skeletons

HI-ECN3 Integration

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30/01/2025

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P42 beamline integration

Reminder: WP4 integration status

ICEA#48_06-12-2024 [NACONS + HI-ECN3]
Friday 6 Dec 2024, 10:00 → 12:00 Europe/Zurich

ICEA#48_minutes.d... ICEA#48_minutes.p...

zoom ICEA#48_06-12-2024 [NACONS + HI-ECN3] Join

10:00 → 11:00 **[NACONS] Complete integration review of BA81 (underground) Fire Detection System** 1h
Speaker: Iliasse Derrag (BE-EA-DC)
ICEA48 BA81 Exten... ICEA48 BA81 Exten...

11:00 → 11:10 **[HI-ECN3] New beam line skeleton** 10m
New beam line skeleton for HI-ECN3 and impact on current beam line (TDC85, TCC8)
Speaker: Beatriz Martinez Sutil (CERN)
P42Layout_JCEA_4... P42Layout_JCEA_4...

11:10 → 11:20 **[HI-ECN3] Services rerouting around p42 dump in TT83** 10m
Speaker: Beatriz Martinez Sutil (CERN)
P42DumpIntegratio... P42DumpIntegratio...

11:20 → 11:35 **[HI-ECN3] New 911 doors final revision** 15m
Speaker: Beatriz Martinez Sutil (CERN)
B911Door_JCEADec... B911Door_JCEADec...

11:35 → 11:45 **[HI-ECN3] 3D models organization** 10m
Speaker: Beatriz Martinez Sutil (CERN)
3DOrganization_JCE... 3DOrganization_JCE...

11:45 → 12:00 **[HI-ECN3] Relocation of service trench between B.911 and B.912** 15m
Speakers: David Rodriguez Gomez (CERN), Guillaume Cnudde
0911-Implantation-p... 20240512 HI-ECN3 ... 20240512 HI-ECN3 ... ---CE-1_ECN3_RVT2... HI-ECN3 Plan impla...

First proposal of the P42 line presented

911 new door integration validated


HI-ECN3 models location

<https://indico.cern.ch/event/1485956/>

P42 beamline constraints

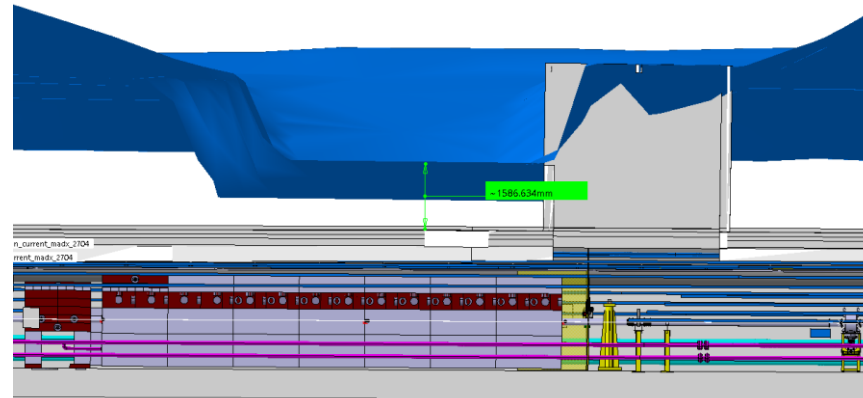
P42 v.1 beamline MADX file received on November 2024 where a few modifications were needed.

New P42 line MADX files will be provided with:

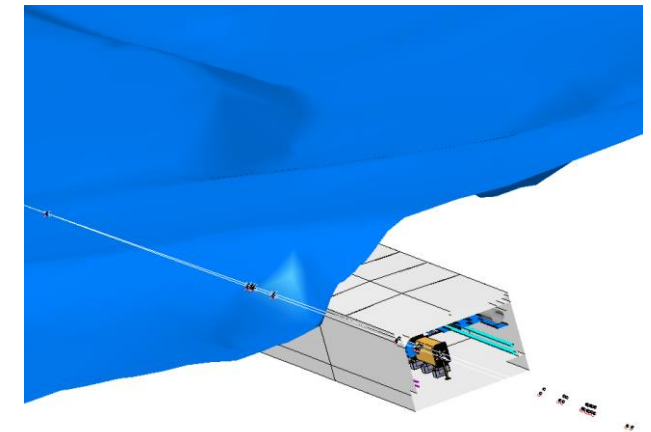
- Last bend: Vertical angle adjusted.
- MBNH.X0450792 and MBNH.X0450795 relocated.
- Beam dilution system.
- BSG upstream the target,
- New position of the target start along the beam line.  **TBC** by integration




Checked the soil level above the elements

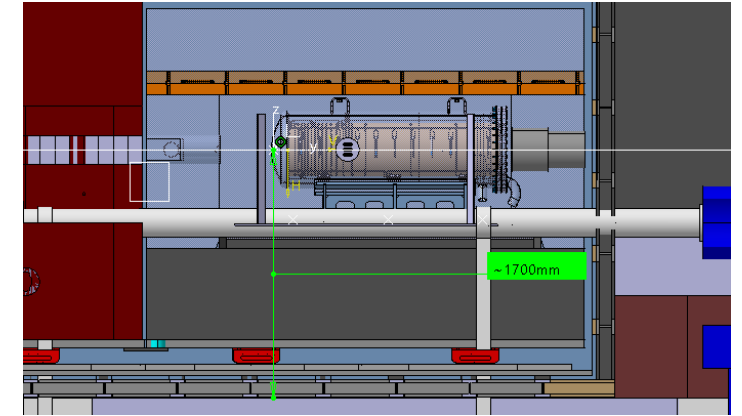
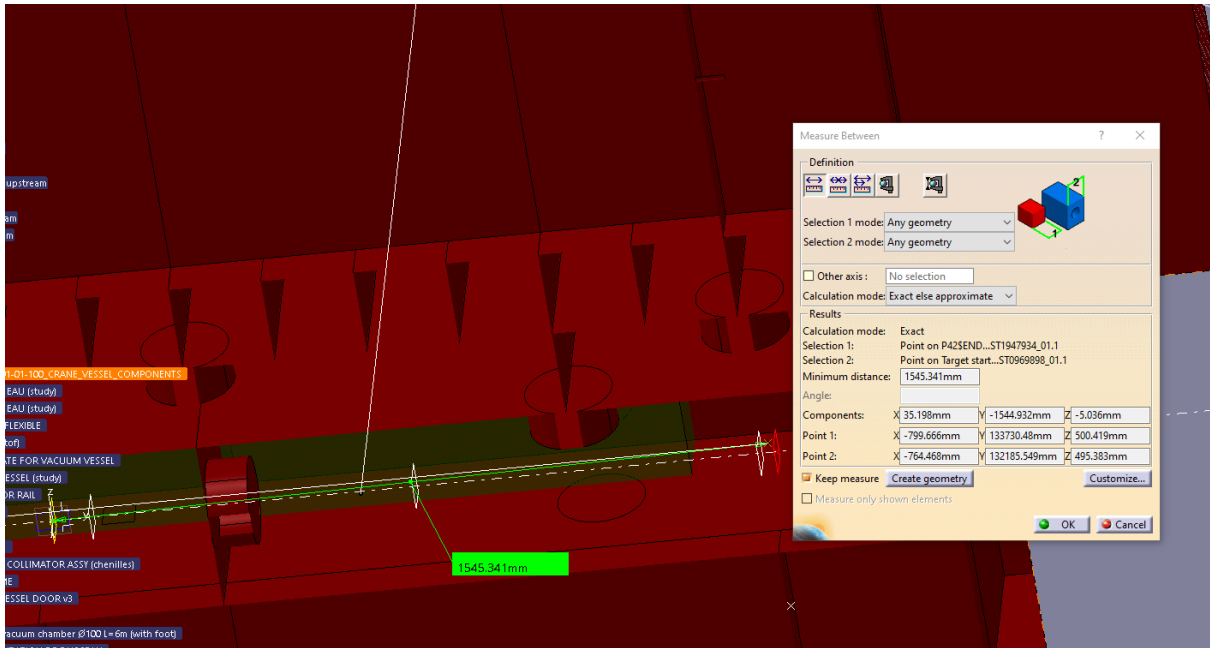


1 Ramp on top of shielding 



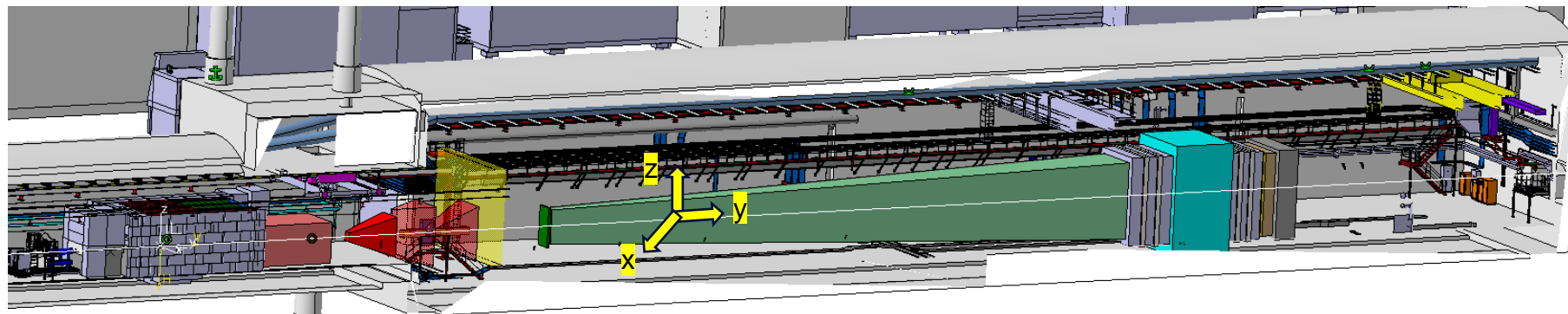
2 Bridge on top of MBNH.X0450792 and MBNH.X0450795 

P42 v.1 beamline integration I

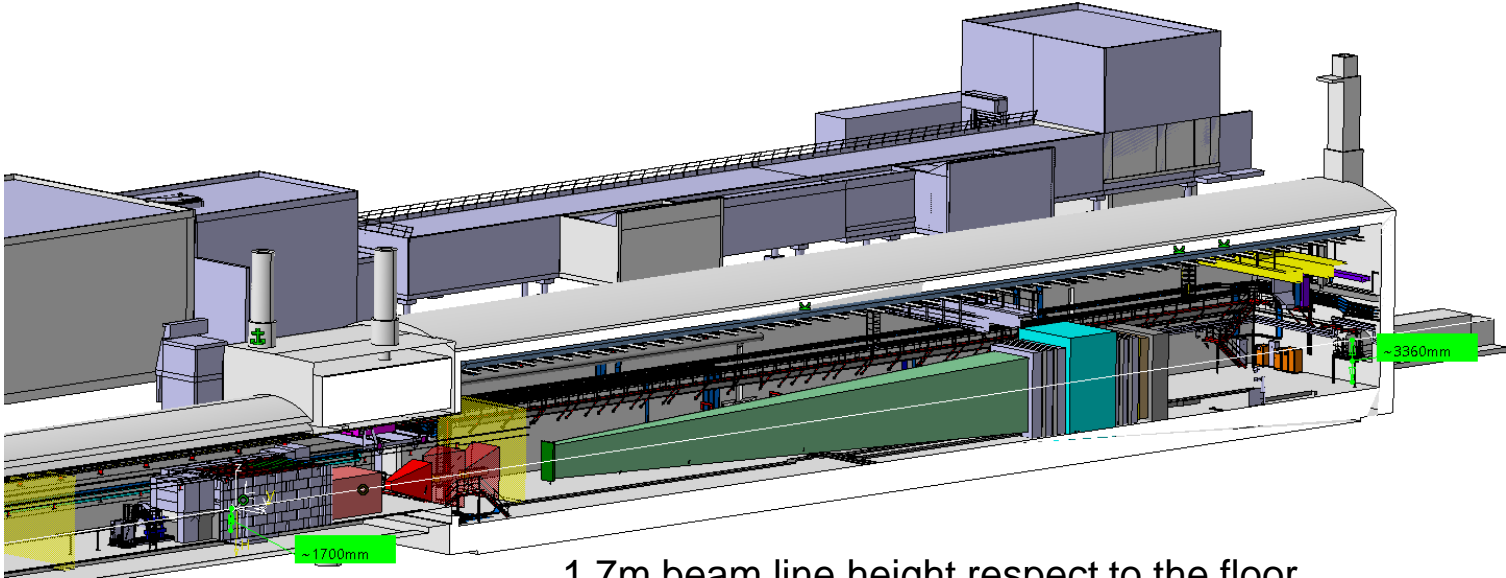


P42 v.1 END is 1.5m downstream respect to **P42 v.0 END** skeleton. In X and Z there is almost no difference.

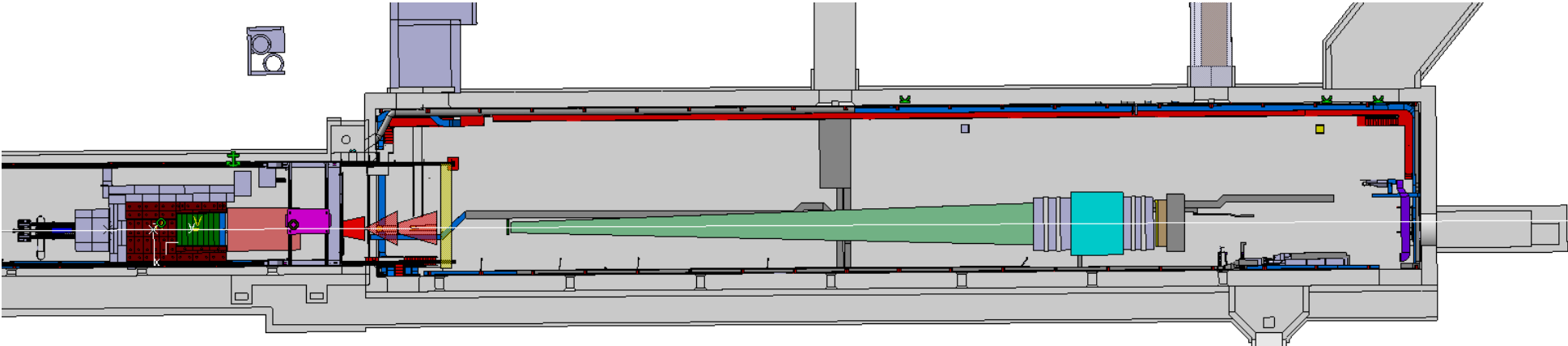
(Y) along the beam line to be defined depending in the integration constraints



P42 v.1 beamline integration II

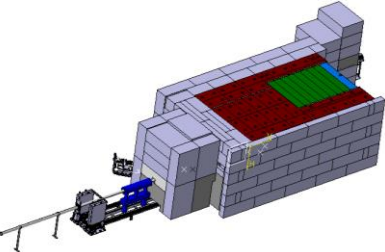


1.7m beam line height respect to the floor.

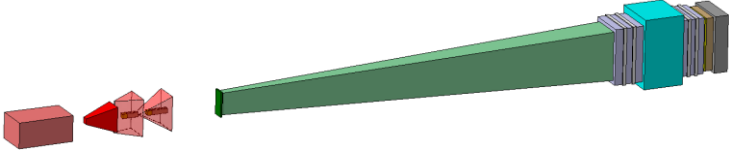


Beam line parallel to the TCC8 and ECN3 walls and floor.

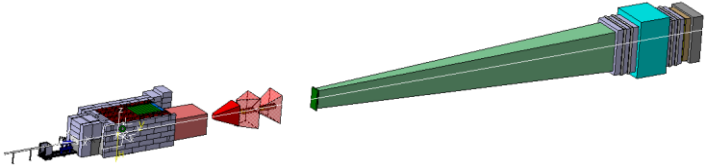
Overview of baseline models I



BDF TARGET COMPLEX ASSY (current)
(STI)



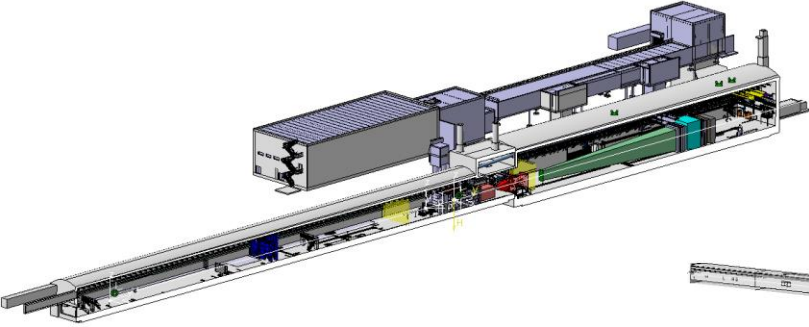
SHiP detector preliminary layout
(EP)



SHiP target and detector preliminary layout
(EP)



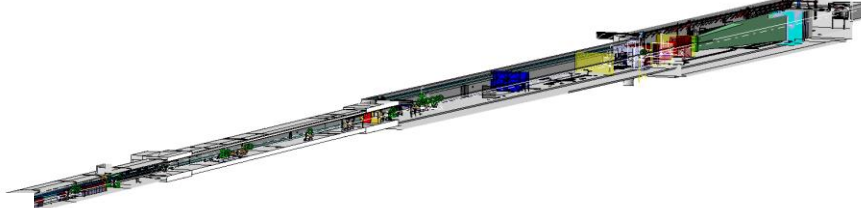
Layout_P42line_PostLS3_2704
(EA)



TCC8-ECN3_IntegrationStudy_2705
(EA)



TT85-ECN3_IntegrationStudy_2704
(EA)



TT85-ECN3_IntegrationStudy_2704
(EA)

Overview of baseline models II

Name	Reference	C.S.	Responsability	Description
BDF TARGET COMPLEX ASSY (current)	ST1884082_01		SY-STI	Study of the new target design.
SHiP detector preliminary layout	ST1718677_01		EP-SME	Study of the detector design.
SHiP target and detector preliminary layout	ST1606501_01	2705	EP-SME	Integration detector + target in the SHiP skeleton.
TCC8+ECN3_IntegrationStudy_2705	ST1967028_01	2705	BE-EA	Integration of "SHiP target and detector preliminary layout" in TCC8-ECN3 cavern. Integration of the new C.Eng. models.
Layout_P42line_PostLS3_2704	ST1949012_01	2704	BE-EA	New P42 line layout study.
TT85+TDC85_IntegrationStudy_2704	ST1950060_01	2704	BE-EA	Integration of "SHiP target and detector preliminary layout" in TT85-TDC85 cavern.
TCC8-ECN3_IntegrationStudy_2704	ST1967062_01	2704	BE-EA	Integration of "TCC8+ECN3" and "TT85+TDC85" studies

Table 1.- Summary of the HI-ECN3 study models

Beamline & SHiP skeletons

Beam skeletons overview

- Understand the different skeleton used in the model.
- Agree on the integration skeletons.

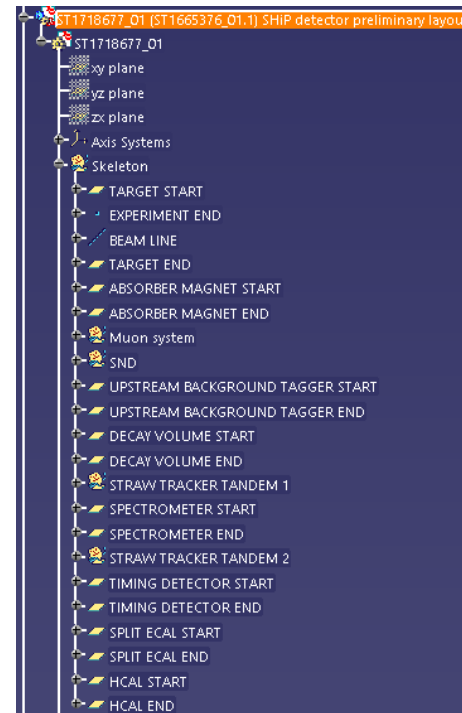
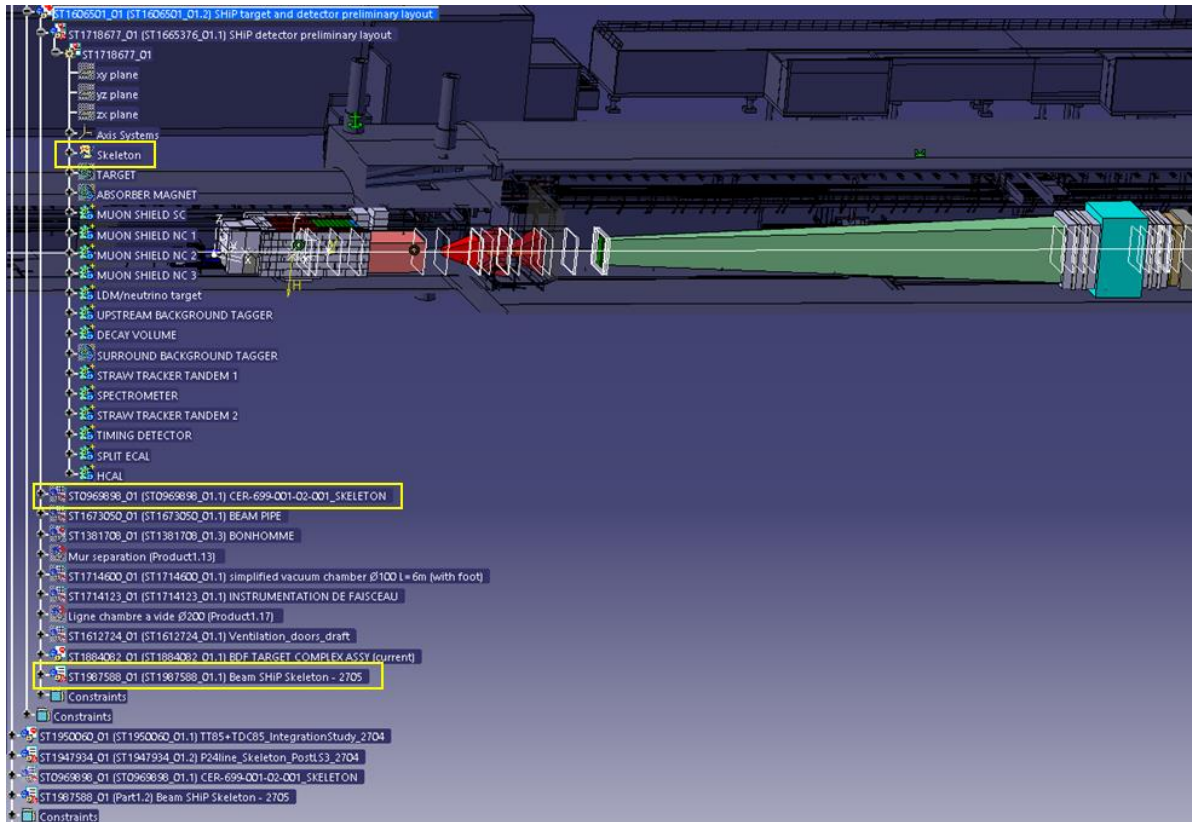


Name	Reference	C.S.	Responsability	Description
P42lineSkeleton_PostLS3_v.2_2704	ST1947934_01	2704	BE-EA	New P42 line imported from MADX files.
Beatch p42_2021	ST1538313_01	2704	BE-EA	Current P42 line imported from beatch files.
SHiP detector preliminary layout	ST1718677_01		EP-SME	Detector design study with the skeleton inside as geometrical set.
CER-699-001-02-001_SKELETON	ST0969898_01		SY-STI	Separate part. Used in the BDF target.
Beam SHiP Skeleton - 2705	ST1987588_01	2705	BE-EA, EP-SME	Simplified skeleton used to place SHiP inside ECN3 respect to 2705 origin.

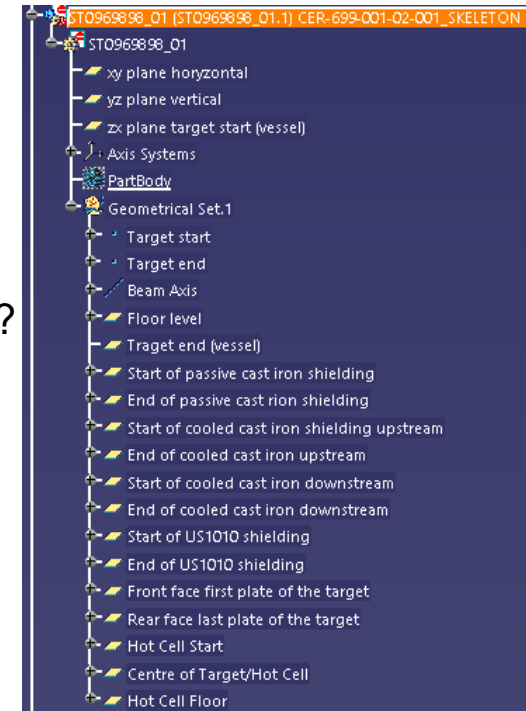
Table 2.- Summary of the skeletons used in TCC8-ECN3.

SHiP skeleton definition

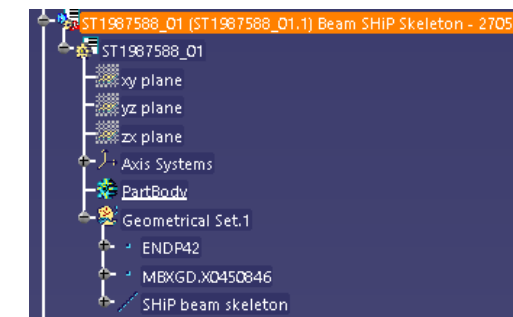
- Proposal:
 - *Target skeleton* inserted in BDF TARGET COMPLEX ASSY.
 - *Detector skeleton* in an independent part from SHiP detector preliminary layout
 - *Relation of SHiP respect to the P42 line*, can be integrated in the MADX P42 beamline in 2705?



Detector skeleton



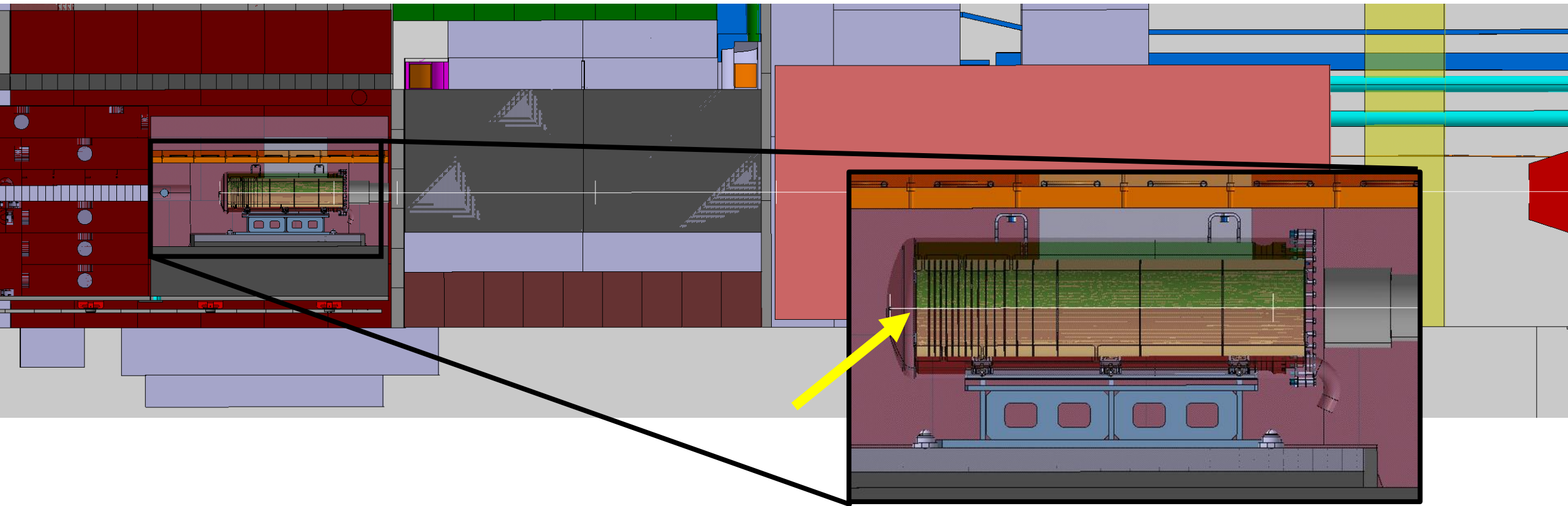
Target skeleton



Relation of SHiP respect to the P42 line

SHiP origin

- SHiP origin at the target front face centered in the target first disc.



Next steps

Next steps

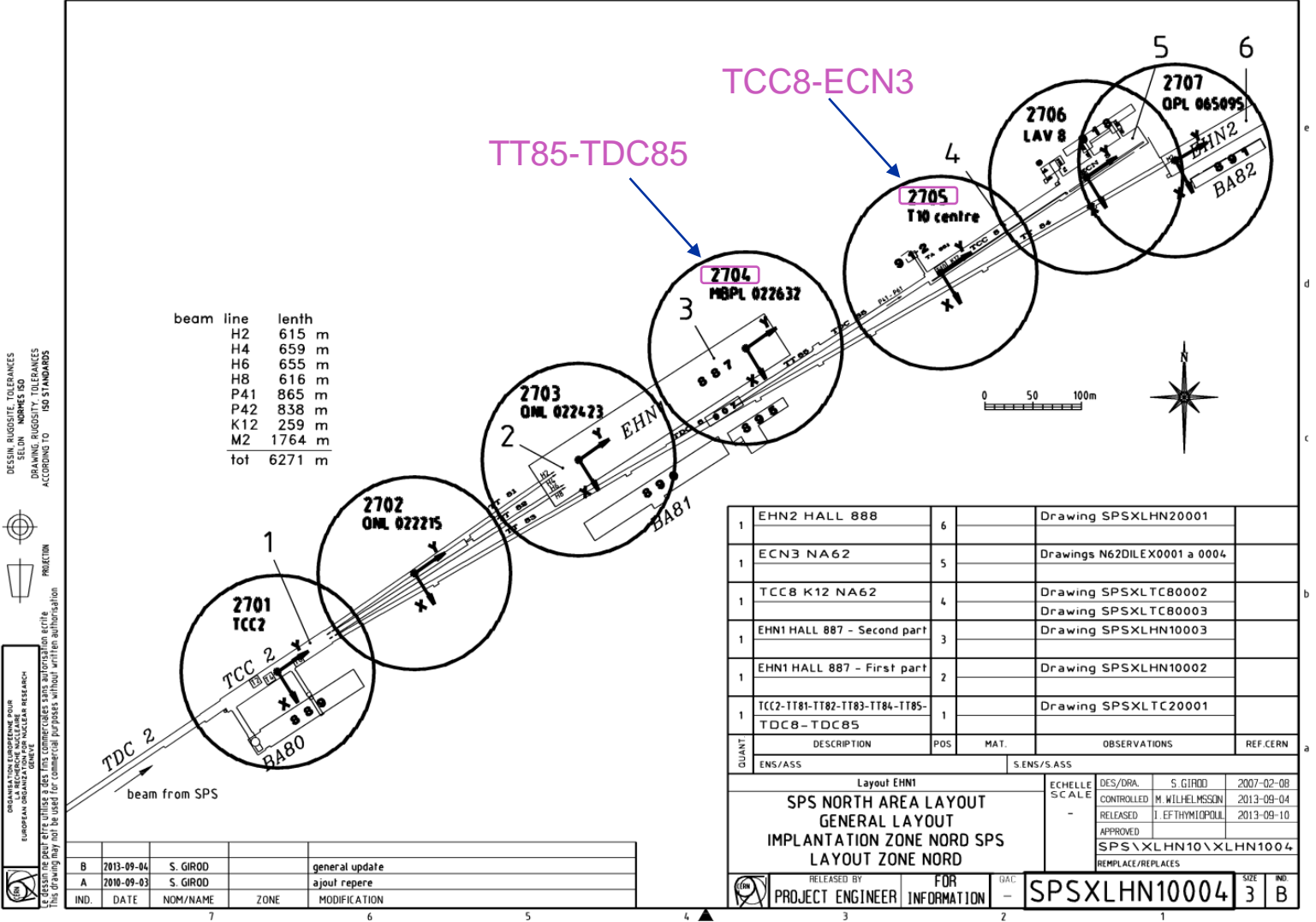
- Define the target SHiP origin position along the beamline.
 - Integrate the ECN3 drainage system.
 - Update spectrometer magnet pit dimensions.
 - Look at the ventilation doors position.
- Reorganise the SHiP & target skeletons.
- Implement then the new P42 MADX files with the updated SHiP origin and all the mentioned changes.



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BACK UP SLIDES

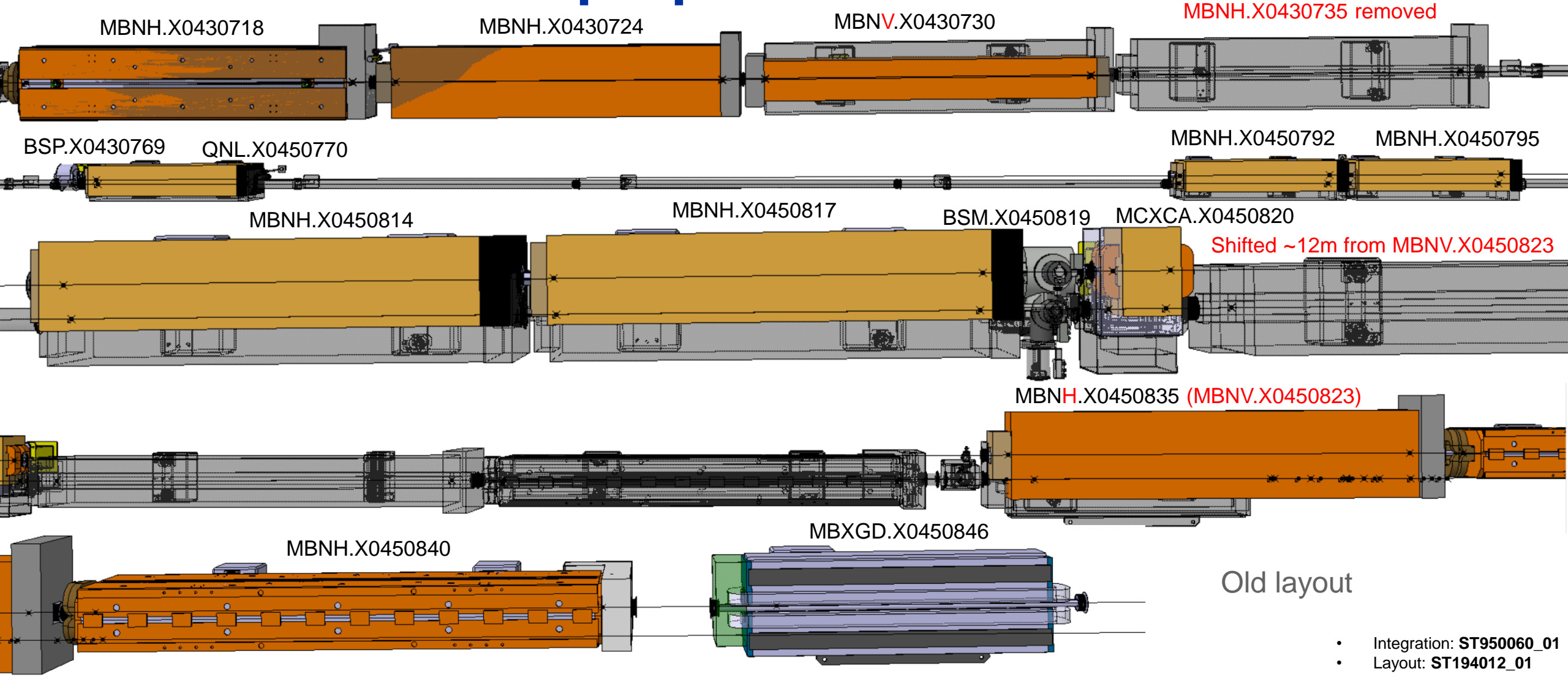
Introduction: NA CATIA coordinate systems



S. Girod



Introduction: First proposal of the P42 line



- Integration: **ST950060_01**
- Layout: **ST194012_01**