

PSI

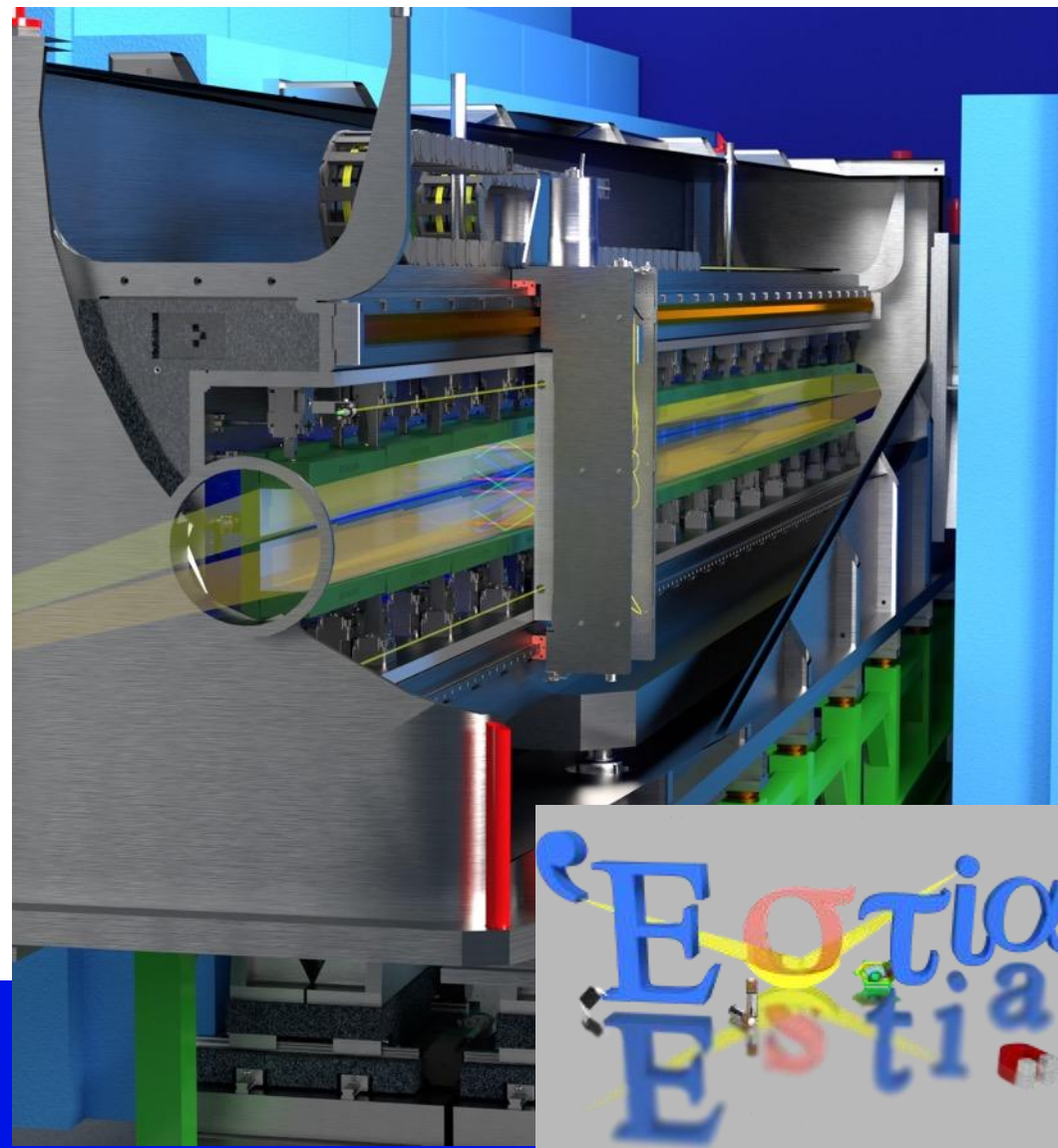


EUROPEAN
SPALLATION
SOURCE

System Acceptance Review (SAR)

ESTIA

Instrument Components Overview

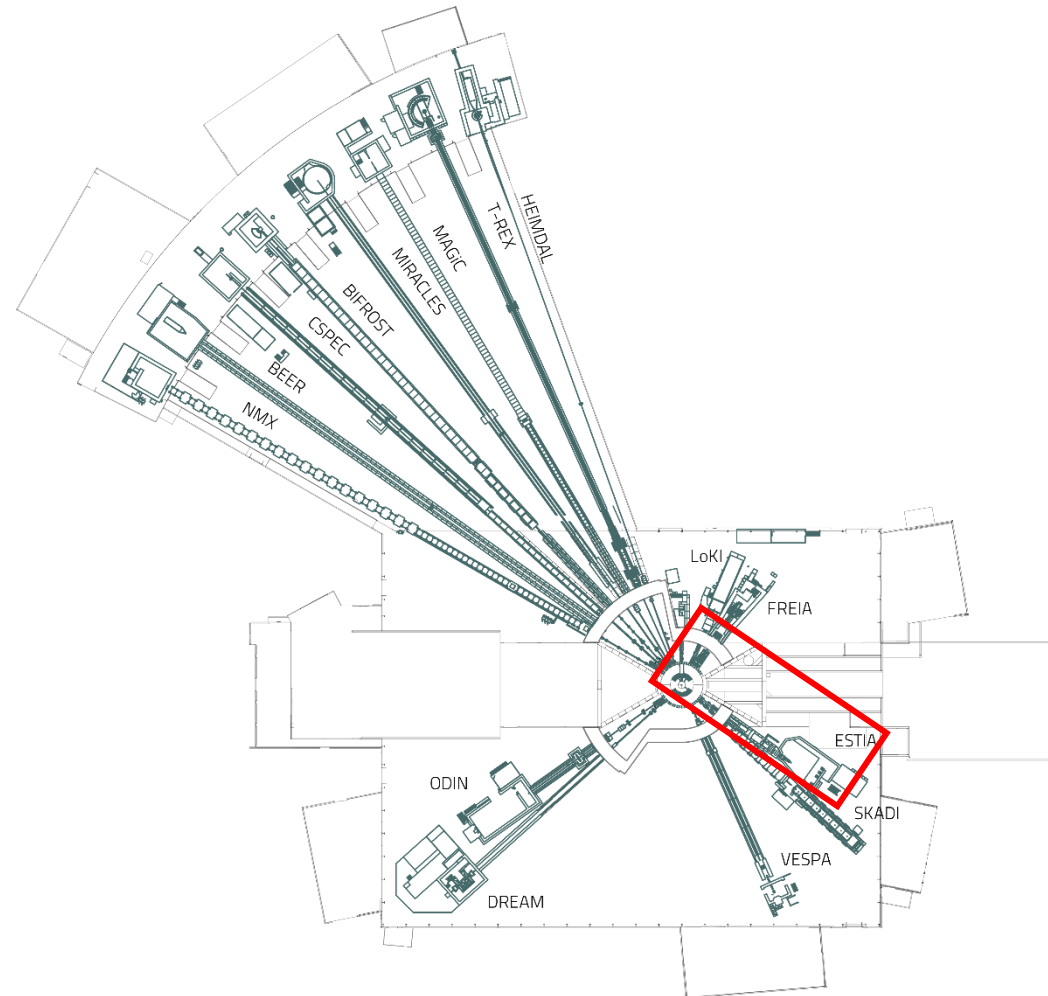


Peter Heimgartner
Lund, 17-06-2026

- 1 Overview of ESTIA-Layout
- 2 FBS and LBS Structure of ESTIA
- 3 Component Overview of ESTIA
 - Beam Transport and Conditioning
 - Sample Exposure
 - Scattering Characterization System
 - Support System
 - Supply System
 - Vacuum System
 - Experimental Cave
 - (Instrument Automation Control) → presented in a separate talk
 - Data Management & Experiment Control System → presented in a separate talk
 - (Personal Safety System (PSS)) → presented in a separate talk

Overview of ESTIA-Layout

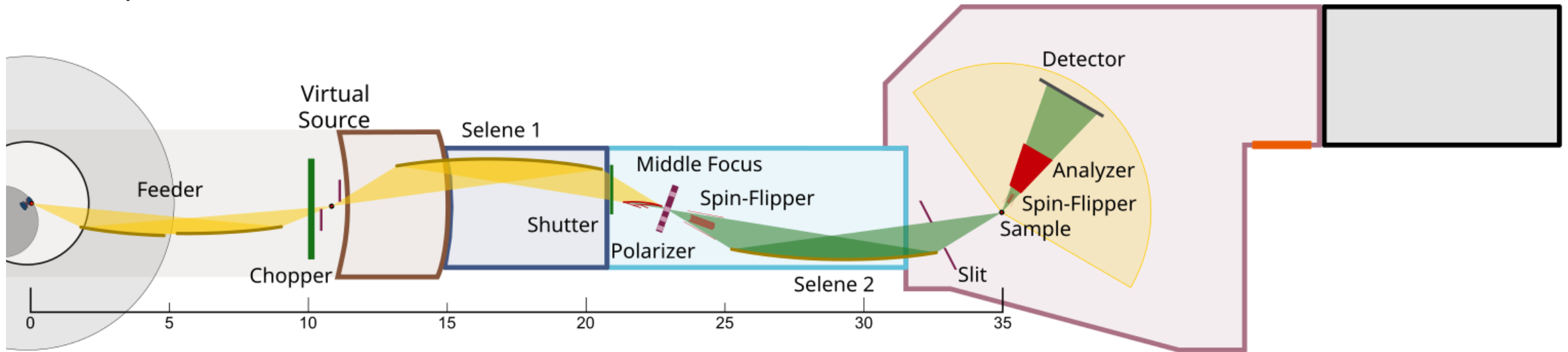
Location: S03 (South Sector), Instrument Hall D01, Port E02



Overview of ESTIA-Layout

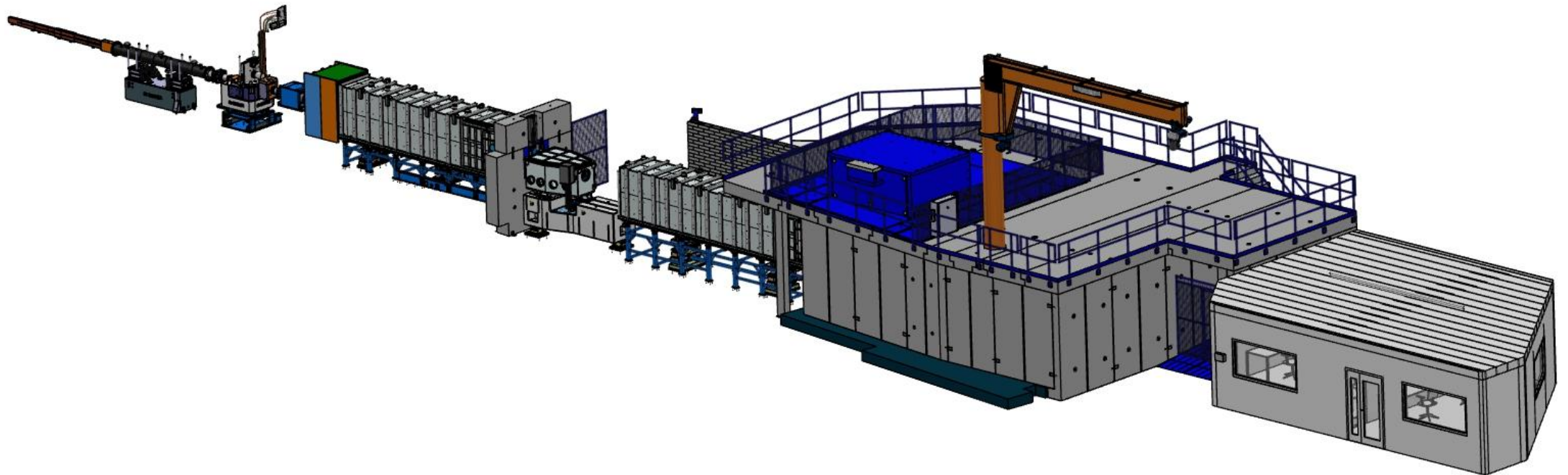
Schematic

ESTIA explained in one minute

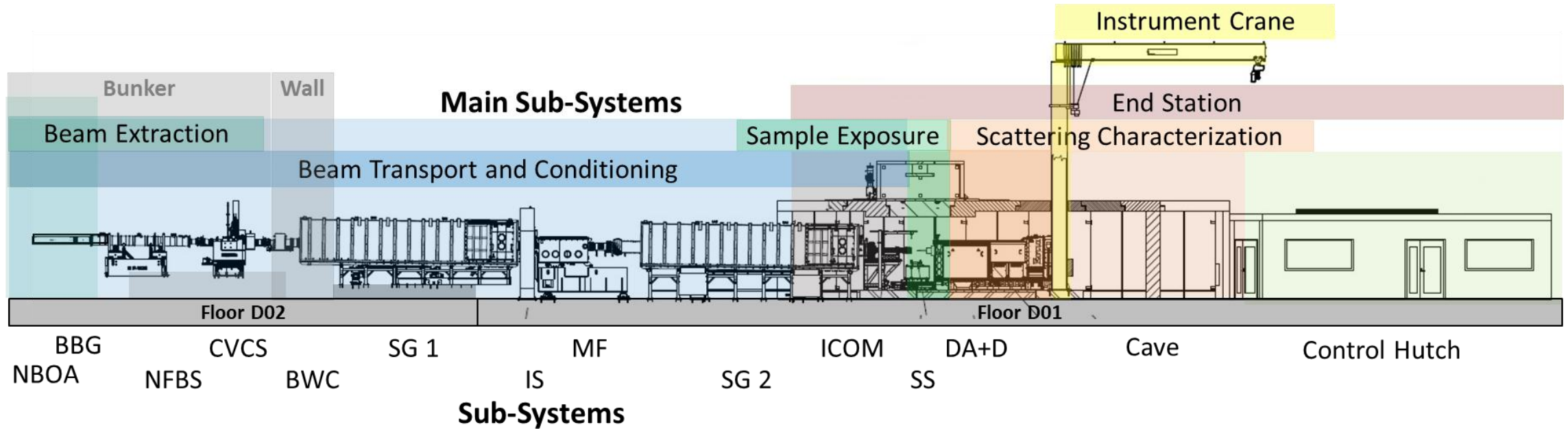


Overview of ESTIA-Layout

3D View



Overview of ESTIA-Layout

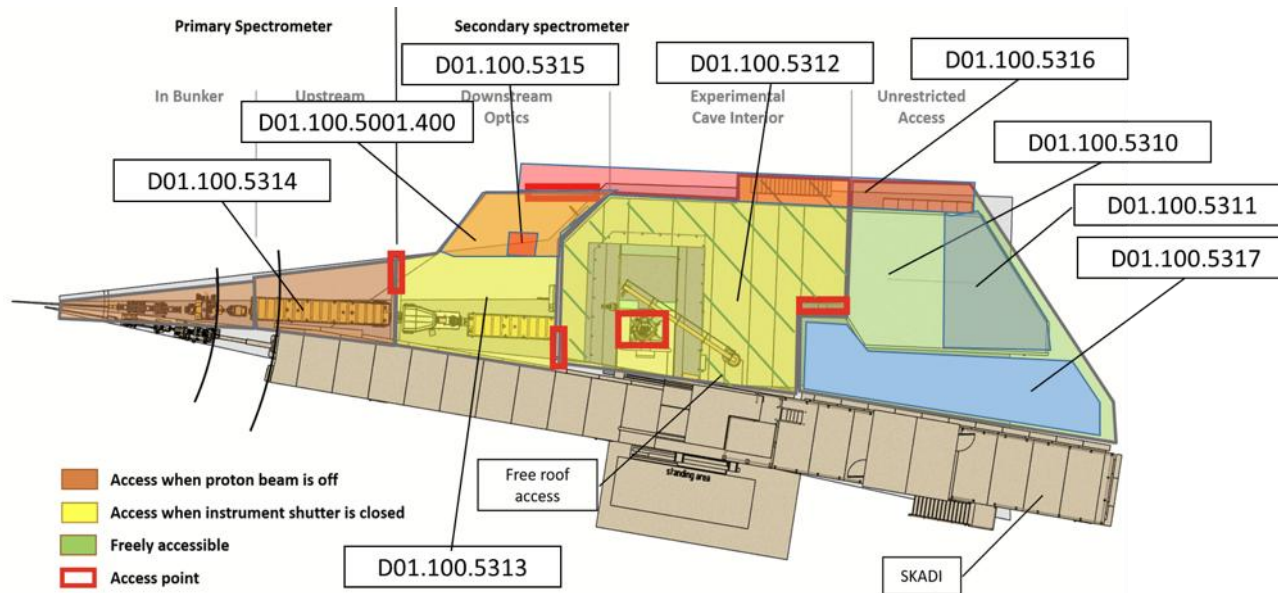


FBS and LBS Structure

FBS Structure

Level		FBS	Description
0	ESTIA	=ESS.NSS.H01.ESTIA	Estia
1	A01	=ESS.NSS.H01.ESTIA.A01	Beam Transport and Conditioning System
1	A02	=ESS.NSS.H01.ESTIA.A02	Sample Exposure System
1	A04	=ESS.NSS.H01.ESTIA.A04	Support System
1	A05	=ESS.NSS.H01.ESTIA.A05	Supply System
1	B01	=ESS.NSS.H01.ESTIA.B01	Scattering Characterization System
1	F01	=ESS.NSS.H01.ESTIA.F01	Personnel Safety System (ESTIA PSS)
1	G01	=ESS.NSS.H01.ESTIA.G01	Vacuum System (ESTIA)
1	K01	=ESS.NSS.H01.ESTIA.K01	Instrument Automation Control System
1	K02	=ESS.NSS.H01.ESTIA.K02	Data Management & Experiment Control System
1	U01	=ESS.NSS.H01.ESTIA.U01	Experimental Cave

LBS Structure



FBS	Description
D01.100.5310	ESTIA Control Hutch
D01.100.5311	ESTIA Sample Preparation Area
D01.100.5312	ESTIA Experimental Cave
D01.100.5313	ESTIA Beamline
D01.100.5314	ESTIA Selene Guide 1 Area
D01.100.5315	ESTIA Instrument bunker rack area
D01.100.5001.400	ESTIA Bunker rack area
D01.100.5316	ESTIA Cave wall rack area
D01.100.5317	ESTIA Cave entrance area

Overview Components

Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01)

Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01)



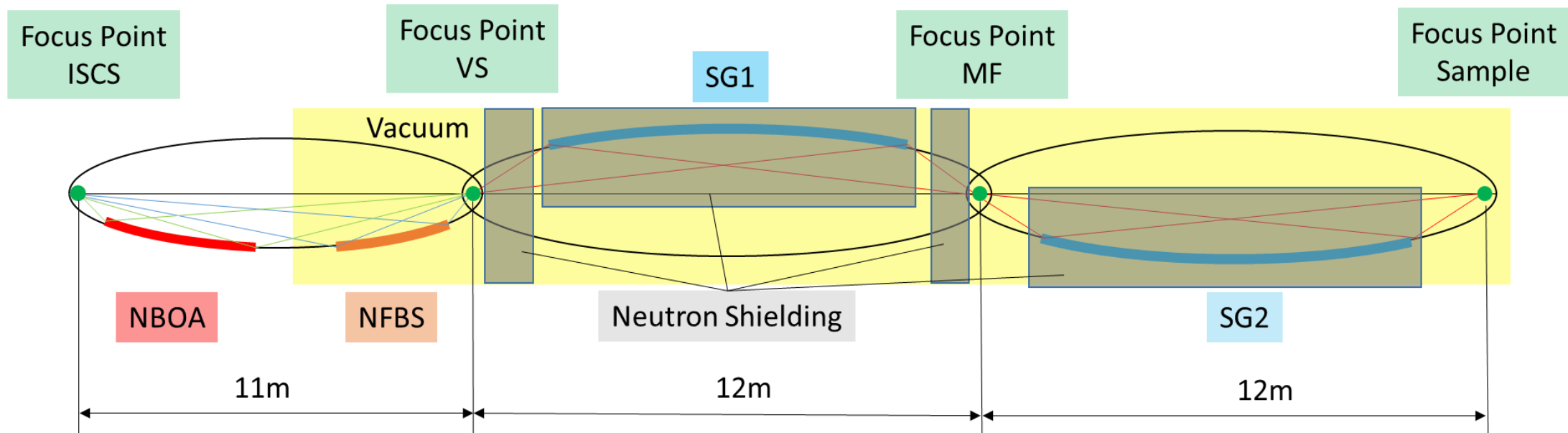
FBS	Description
=ESS.NSS.H01.ESTIA.A01.W02	Beam Extraction
=ESS.NSS.H01.ESTIA.A01.W01	Beam Delivery
=ESS.NSS.H01.ESTIA.A01.R01	ESTIA Chopper System
=ESS.NSS.H01.ESTIA.A01.R02	Beam Geometry Conditioning
=ESS.NSS.H01.ESTIA.A01.R03	Beam Cut-off
=ESS.NSS.H01.ESTIA.A01.R04	Beam Polarizer and Filter
=ESS.NSS.H01.ESTIA.A01.B01	Beam Validation
=ESS.NSS.H01.ESTIA.A01.F01	Neutron Guide Shielding

Beam Transport and Conditioning

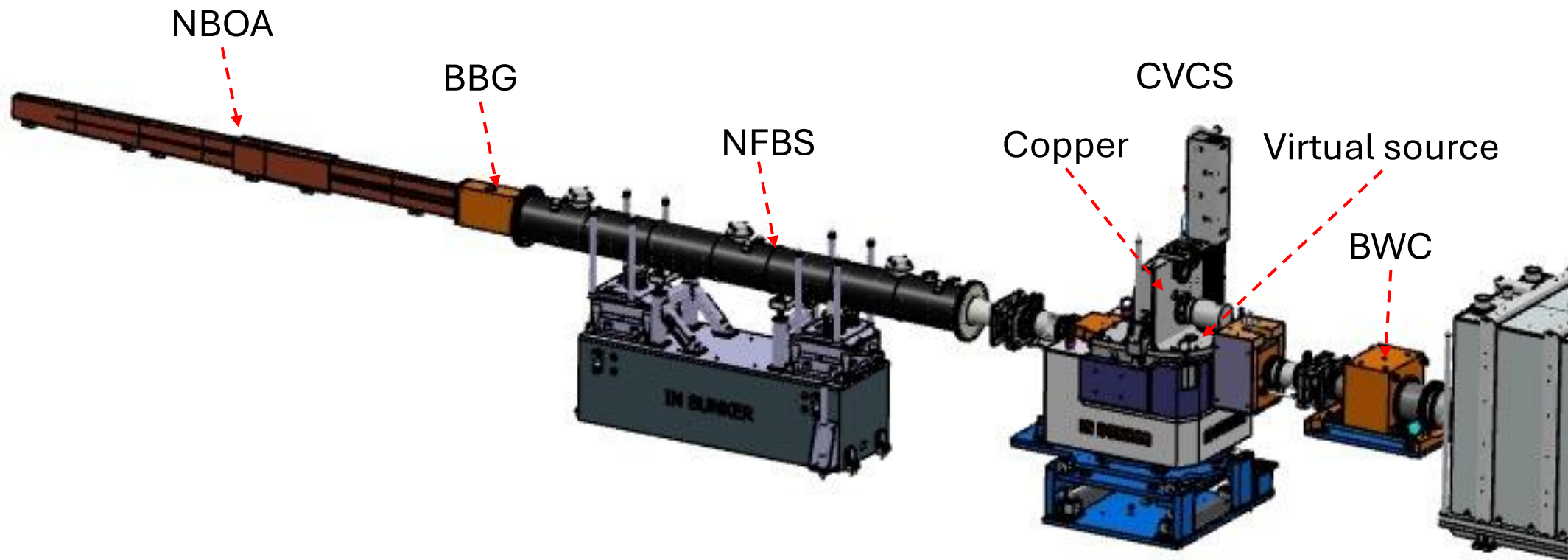
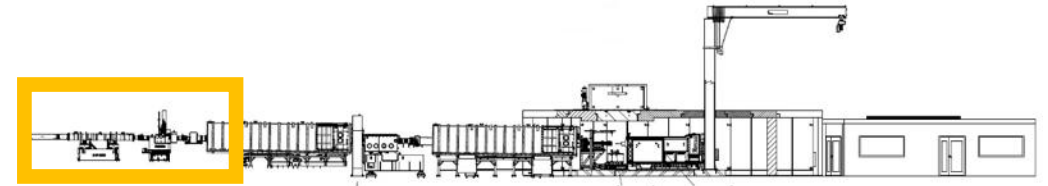
(=ESS.NSS.H01.ESTIA.A01)

Beam Delivery System

(=ESS.NSS.H01.ESTIA.A01.W01)



Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

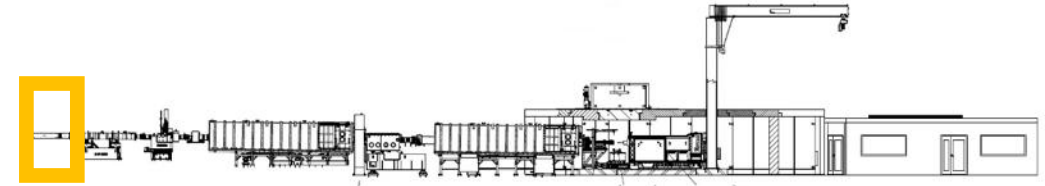


Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

Beam Extraction System

(=ESS.NSS.H01.ESTIA.A01.W02)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Neutron Beam Optics Assembly (NBOA)	..ESTIA.A01.W02.WH01	ESS-2820476	ESS-0098542	ESS-5459566
Bridge Beam Guide Optics Ass. (BBGOA)	..ESTIA.A01.W02.WH02	ESS-4813488	ESS-2024272	ESS-5151290

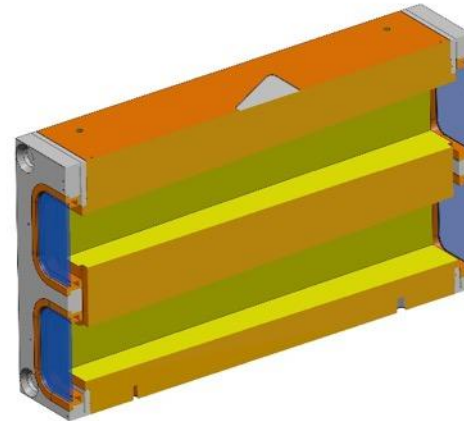
NBOA

Installed in the Neutron Beam Port Inset (NBPI)



BBGOA

Installed in the Light Shutter System (LSS)

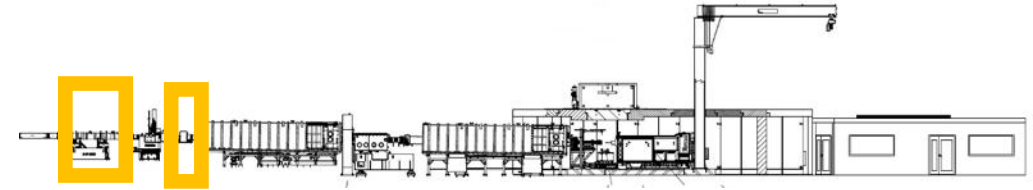


Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

Beam Delivery in-Bunker

(=ESS.NSS.H01.ESTIA.A01.W01.W01)

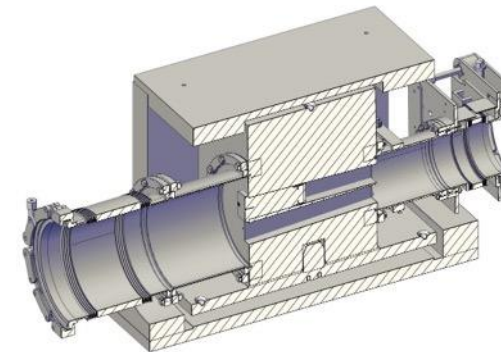
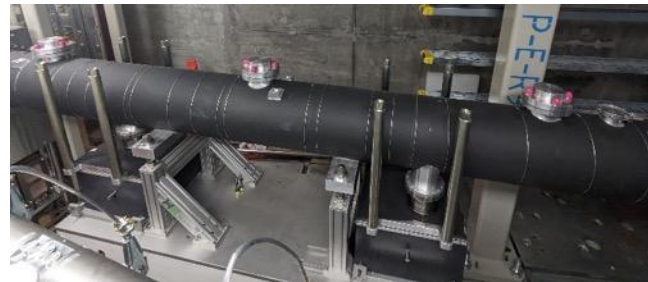
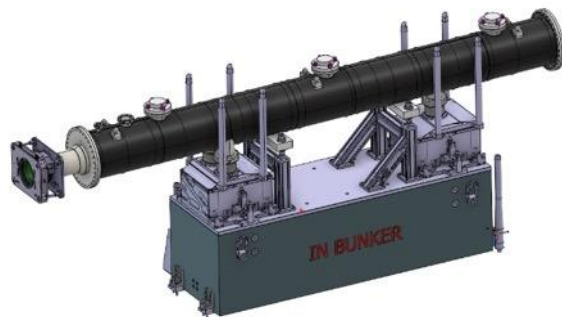


System name	FBS	EPL	CAD-Design	SSDD/TDD
Neutron Feeder In-Bunker System (NFBS)	..ESTIA.A01.W01.W01.WH01	ESS-5152852	ESS-0177460	ESS-5153940
Bunker wall Collimator Feedthrough (BWC)	..ESTIA.A01.W02.W01.WH02	ESS-5314544	ESS-5314612	ESS-5233230

NFBS

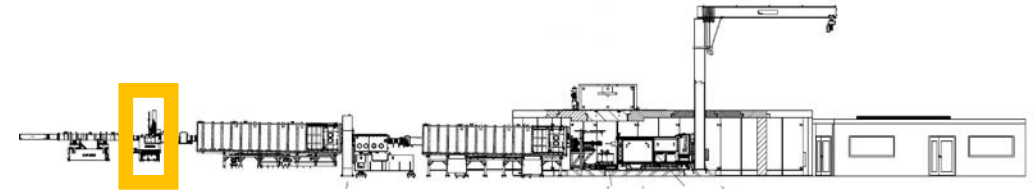
Manually remote adjustable to the Beam Axis

BWC



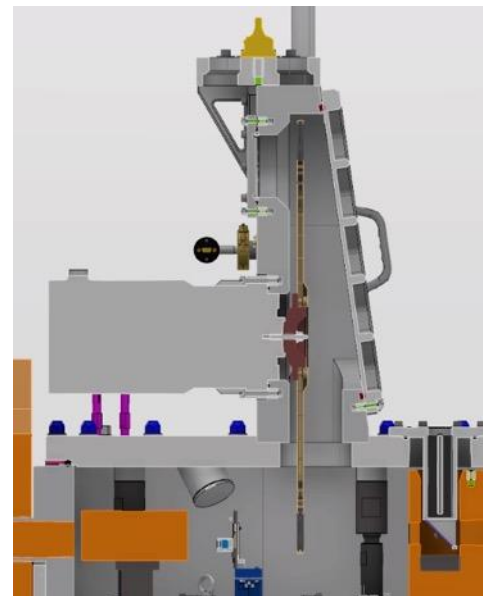
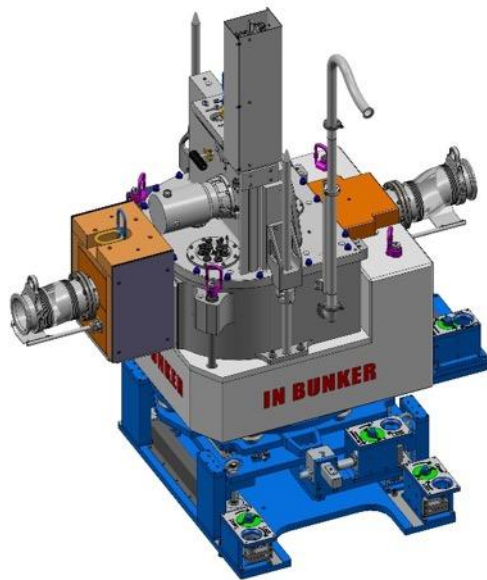
Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

ESTIA Chopper System (=ESS.NSS.H01.ESTIA.A01.R01)



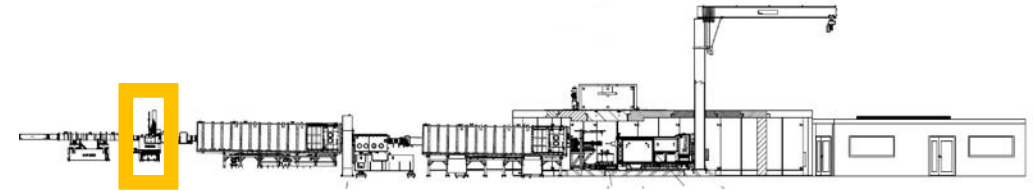
System name	FBS	EPL	CAD-Design	SSDD/TDD
ESTIA Bunker Chopper System (CVCS)	..ESTIA.A01.R01.R01	ESS-3873745	ESS-0311844	ESS-5186219

Chopper System (B4C Resin Al-disc, Diameter 700mm, 14Hz)

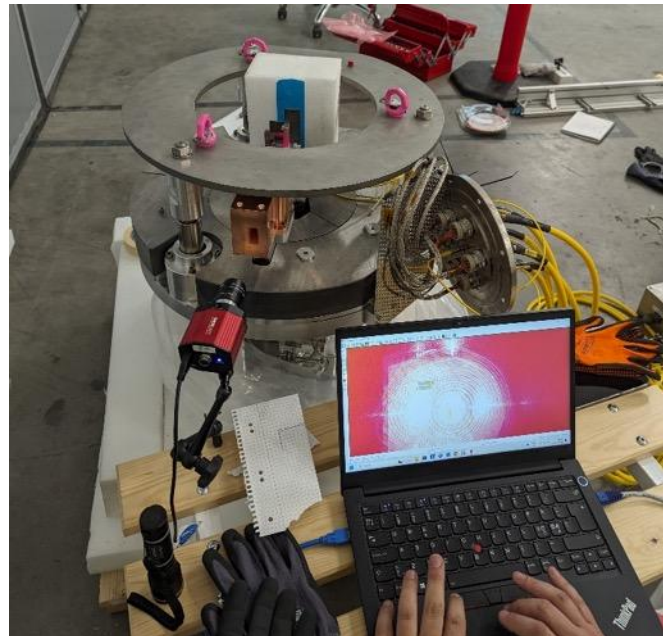
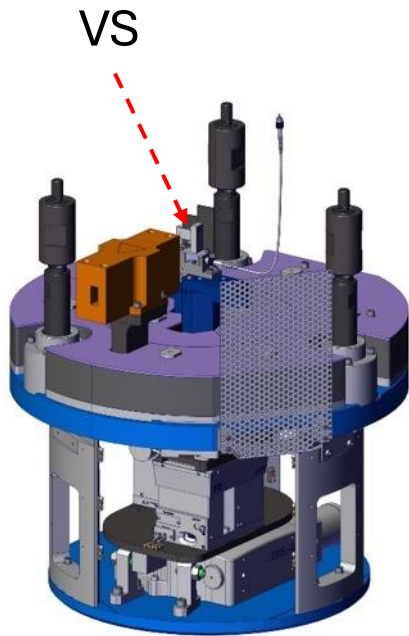


Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

Beam Geometry Conditioning (=ESS.NSS.H01.ESTIA.A01.R02)



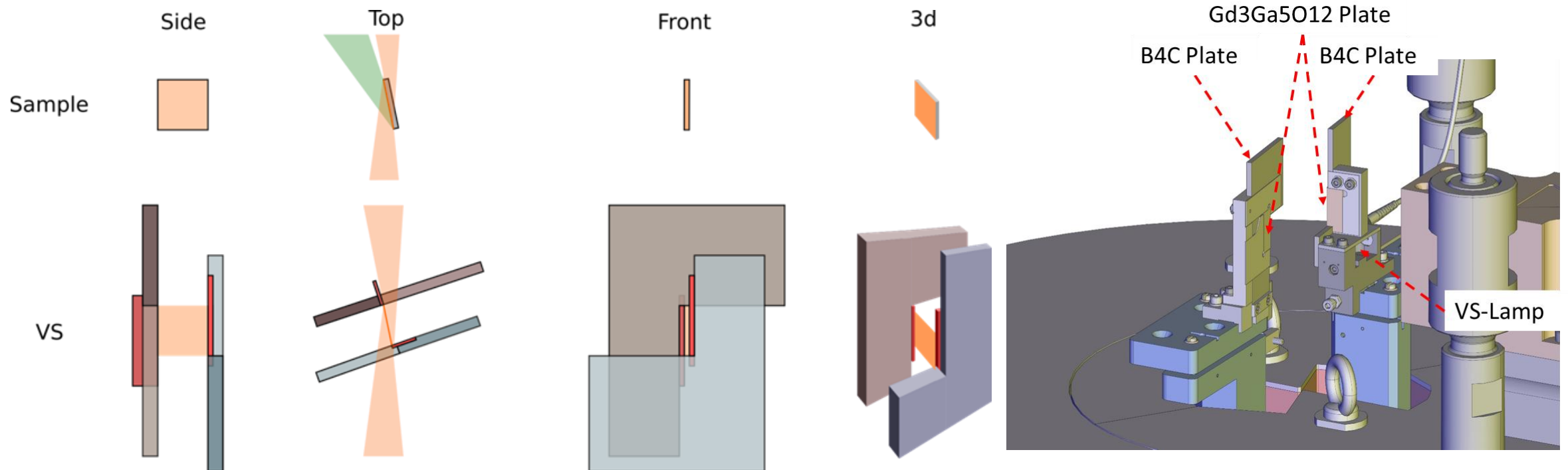
System name	FBS	EPL	CAD-Design	SSDD/TDD
Virtual Source VS (Part of CVCS)	..ESTIA.A01.R02.R01	ESS-5918740	ESS-3061543	ESS-5186219



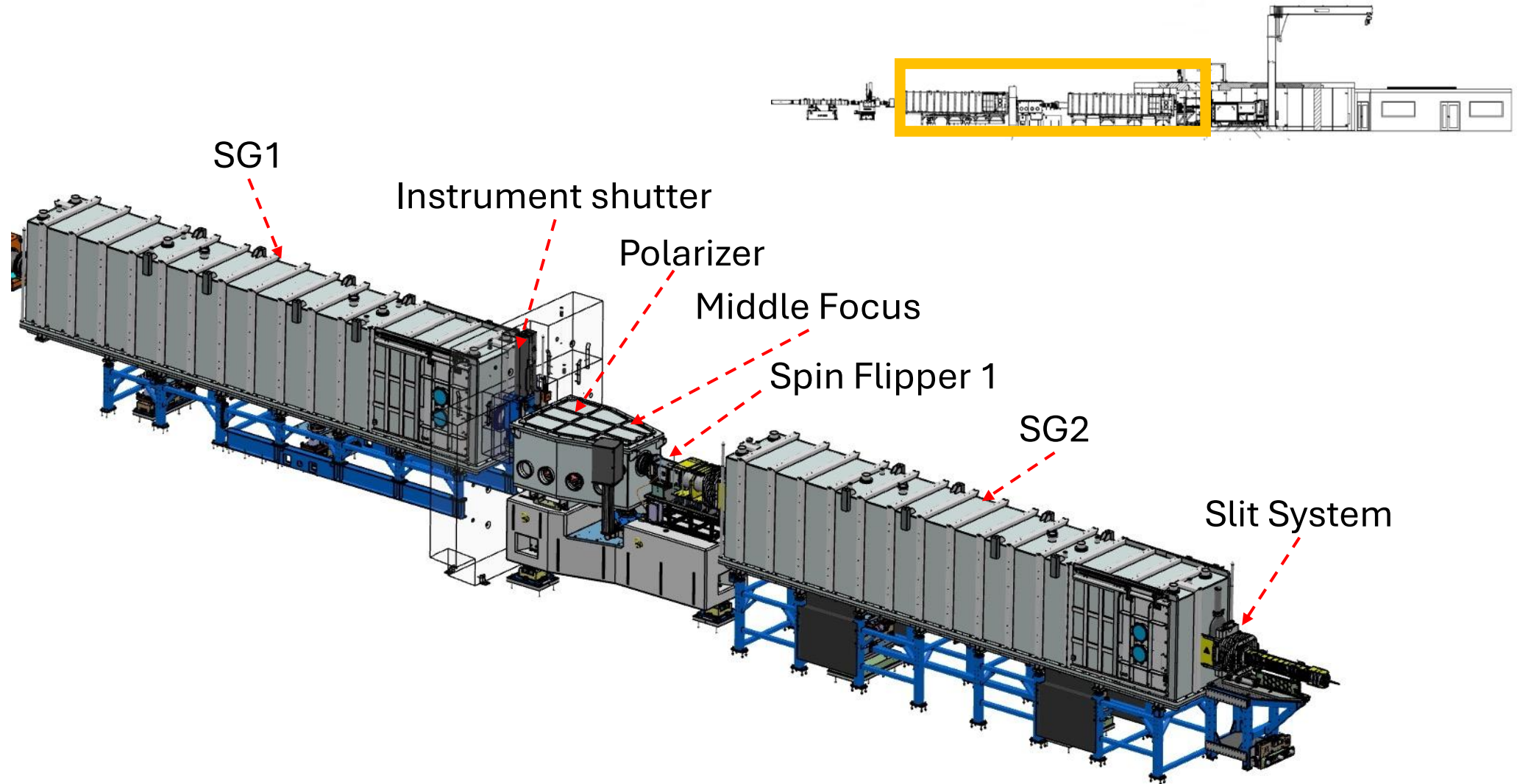
Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (in-Bunker section)

Virtual Source

→ Beam size adjustment at the Sample Point



Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)



Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

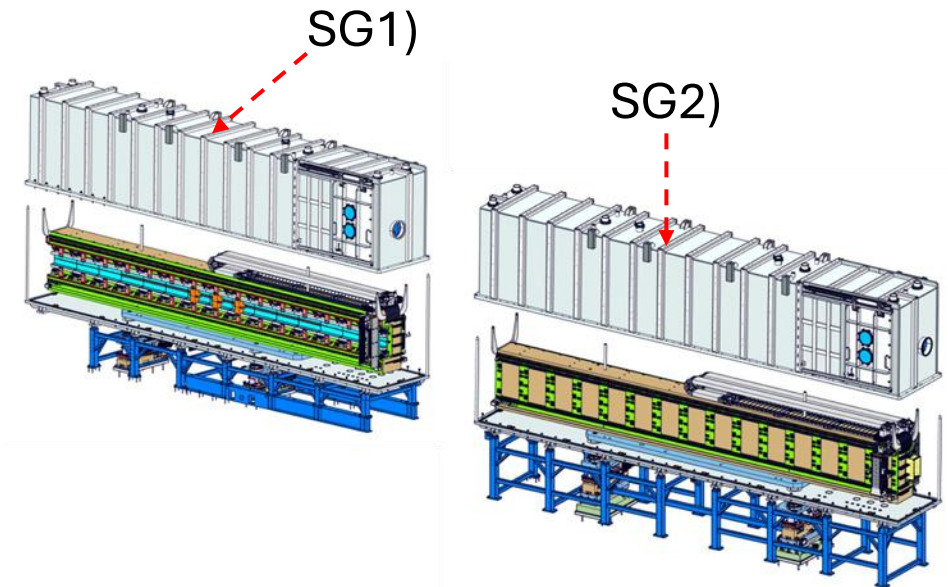
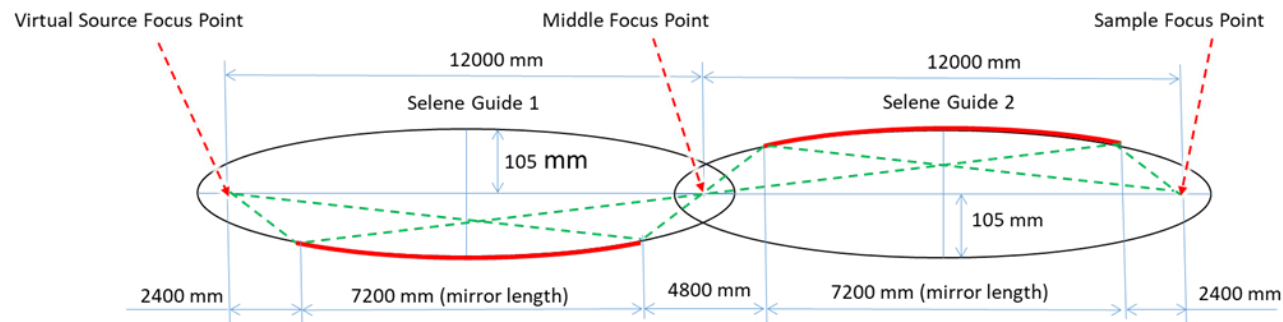
Beam Delivery System

(=ESS.NSS.H01.ESTIA.A01.W01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Selene Guide 1 (SG1)	..ESTIA.A01.W01.W02	ESS-4956527	ESS-0321366	ESS-5312365
Selene Guide 2 (SG2)	..ESTIA.A01.W01.W03	ESS-4956528	ESS-0338567	ESS-5312365

Each Selene Guide has 15 mirror segments, which built the elliptic Mirror with a length of 7200m (vertical and horizontal)



Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

Beam Delivery System (=ESS.NSS.H01.ESTIA.A01.W01)

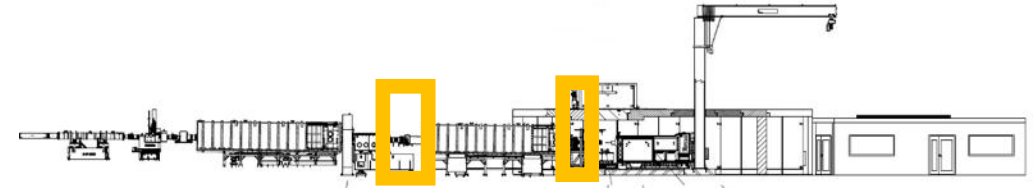


Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

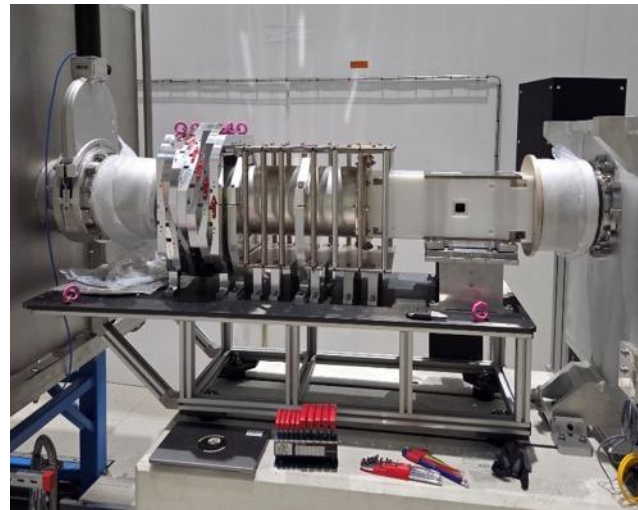
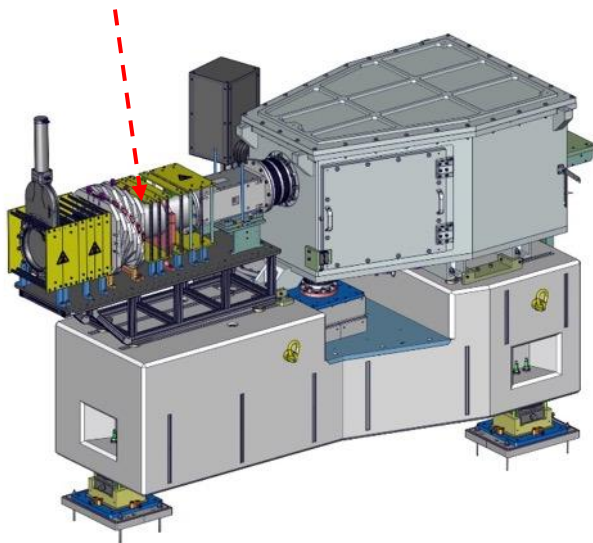
Beam Delivery System

(=ESS.NSS.H01.ESTIA.A01.W01)

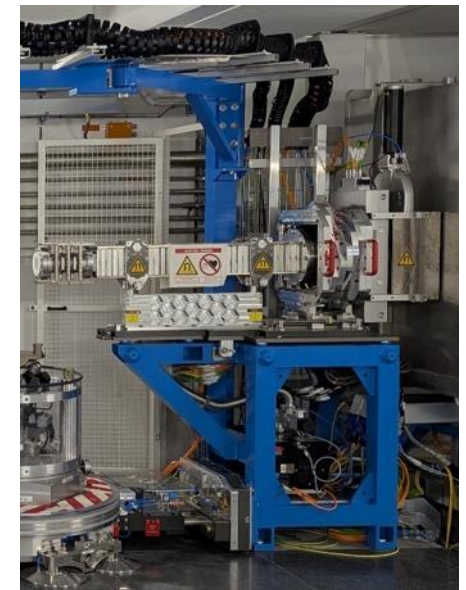
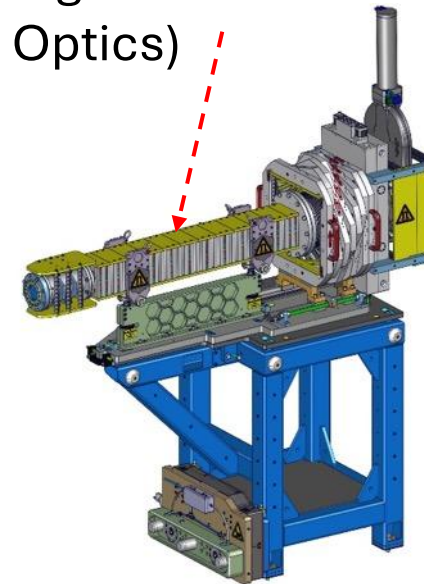


System name	FBS	EPL	CAD-Design	SSDD/TDD
Flight Tube Middle Focus	..ESTIA.A01.W01.W05	ESS-5819544	ESS-5359936	ESS-5345978
Flight Tube In-Cave Optics	..ESTIA.A01.W01.W04	ESS-4956529	ESS-5298194	ESS-5361835

Flight Tube Middle Focus



Flight Tube In-Cave Optics)



Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

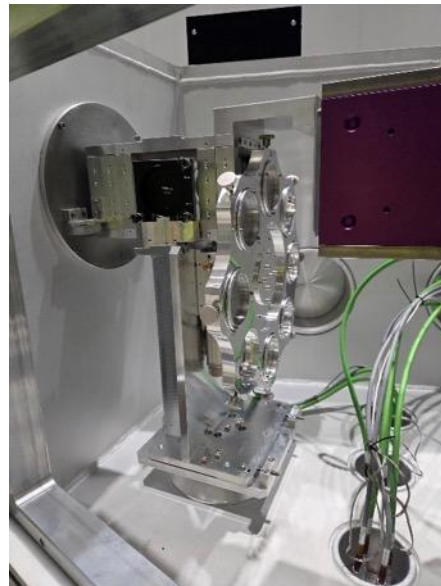
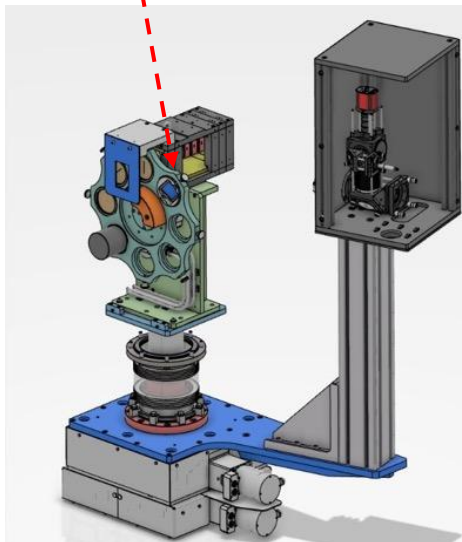
Beam Geometry Conditioning

(=ESS.NSS.H01.ESTIA.A01.R02)

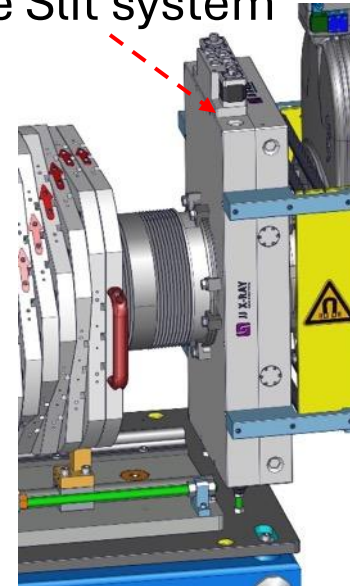


System name	FBS	EPL	CAD-Design	SSDD/TDD
Middle Focus (MF)	..ESTIA.A01.R02.R02	ESS-4857598	ESS-5359936	ESS-5345978
Sample Slit System	..ESTIA.A01.R02.R03	ESS-5693519	ESS-4910220	ESS-5361835

Mask Changer MF

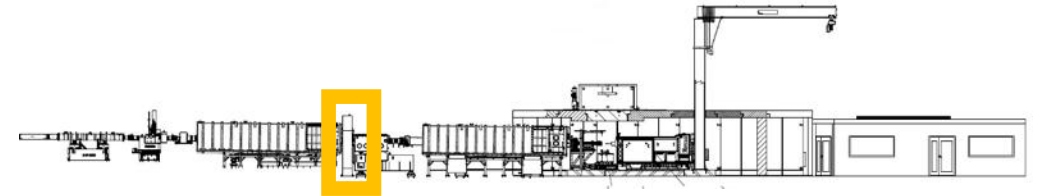


Sample Slit system

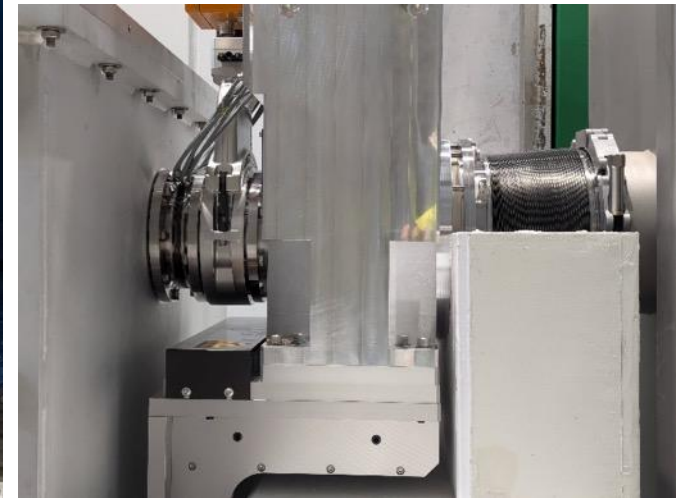
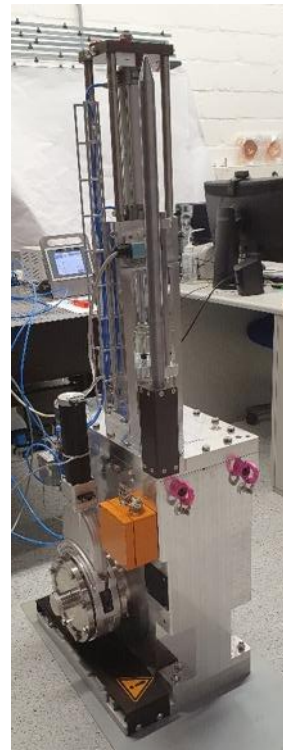


Beam Transport and Conditioning (=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

Beam Cut Off (=ESS.NSS.H01.ESTIA.A01.R03)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Thermal Shutter	..ESTIA.A01.R03.R01	ESS-5248822	ESS-5359890	ESS-5128064

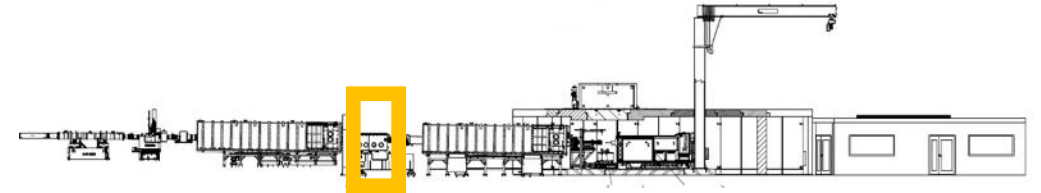


Beam Transport and Conditioning

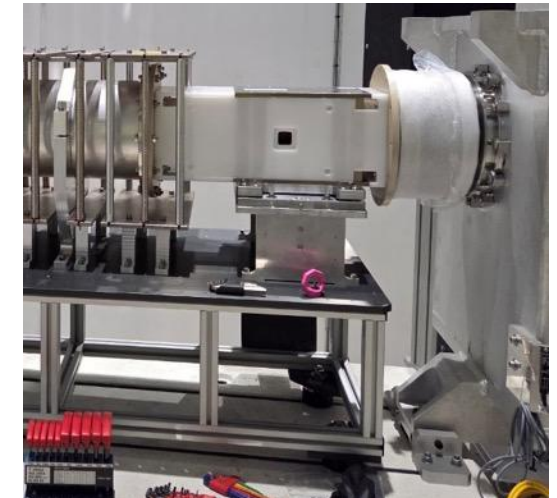
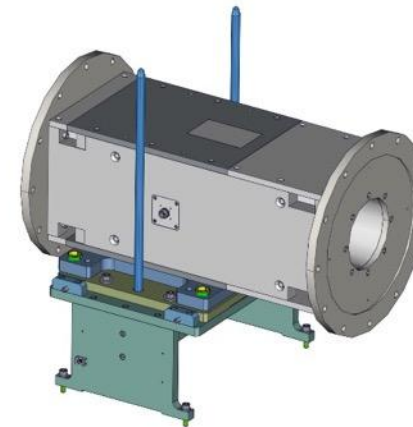
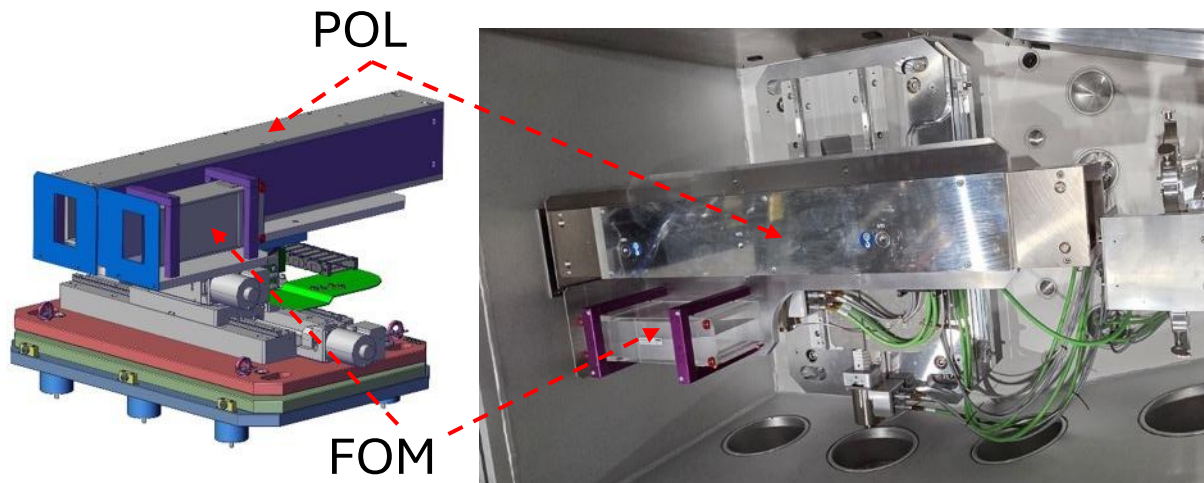
(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

Beam Polarizer and Filter

(=ESS.NSS.H01.ESTIA.A01.R04)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Neutron Polarizer (POL)	..ESTIA.A01.R04.R01	ESS-5918978	ESS-3322942	ESS-5345978
Frame Overlap Mirror (FOM)	..ESTIA.A01.R04.V01	ESS-5918979	ESS-3322942	ESS-5345978
Spin Flipper Polarizer	..ESTIA.A01.R04.T01	ESS-5918980	ESS-5353576	ESS-5345978

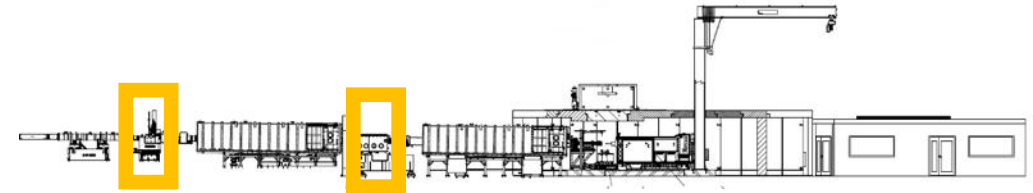


Beam Transport and Conditioning

(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

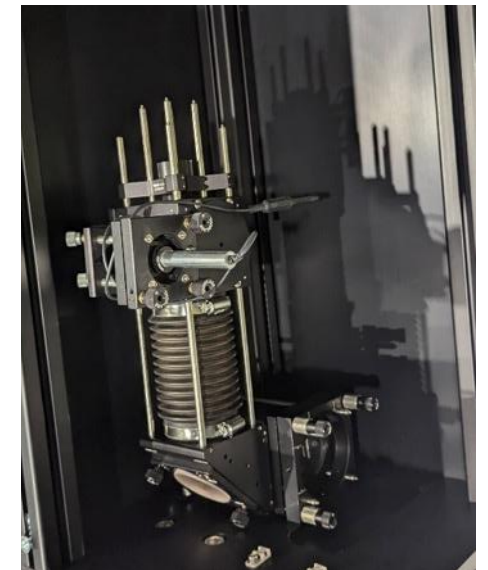
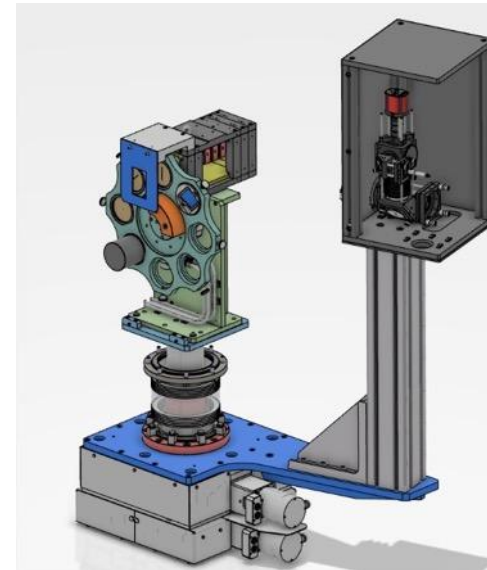
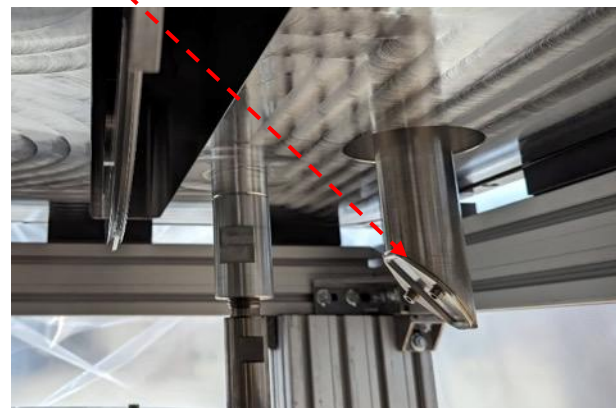
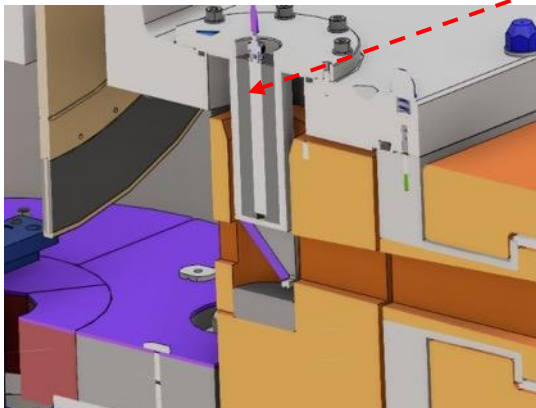
Beam Validation

(=ESS.NSS.H01.ESTIA.A01.B01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Beam Monitor System M1	..ESTIA.A01.B01.B01	ESS-5919205	ESS-0475451	ESS-5186219
Beam Camera System	..ESTIA.A01.B01.B02	ESS-5819543	ESS-3229685	ESS-5345978
Beam Monitor DAQ System in Bunker Zone	..ESTIA.A01.B01.C01	ESS-5918980	N/A	N/A

Beam Monitor System M1



Beam Transport and Conditioning

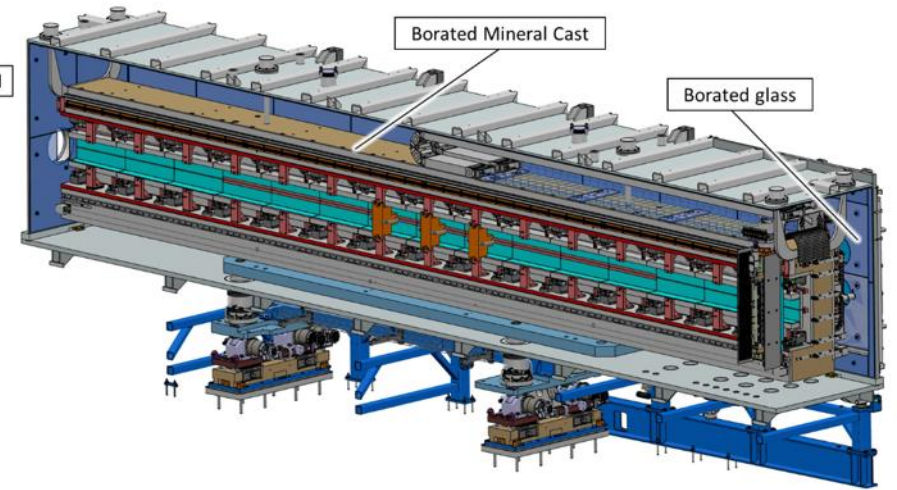
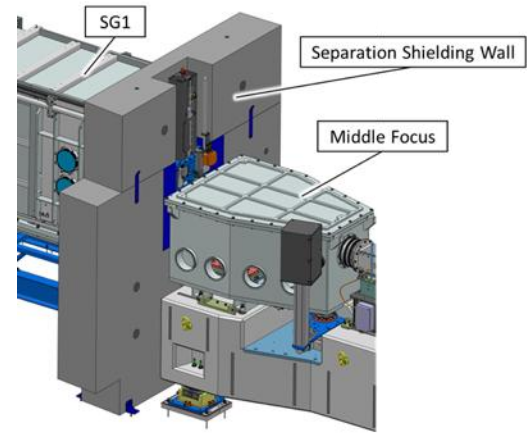
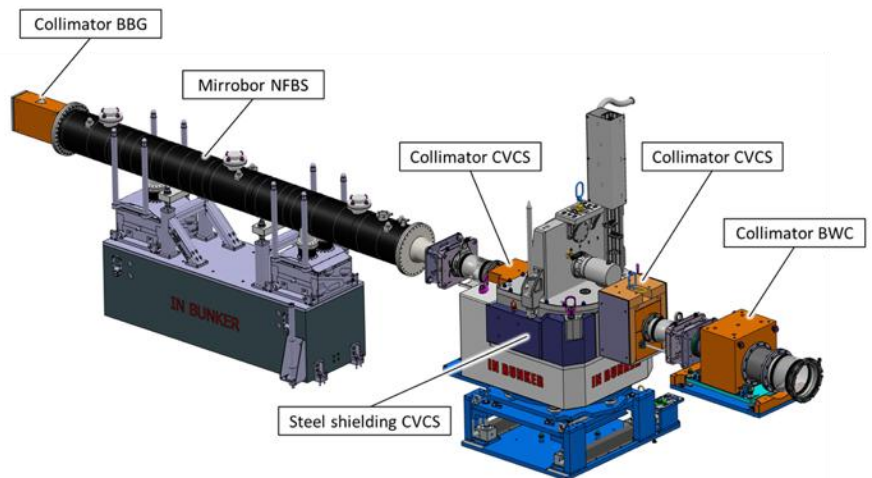
(=ESS.NSS.H01.ESTIA.A01) (Out-Bunker section)

Neutron Guide Shielding

(=ESS.NSS.H01.ESTIA.A01.F01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
In-Bunker Shielding	..ESTIA.A01.F01.F01	ESS-5175800	ESS-5475778	
Wall to Optical area	..ESTIA.A01.F01.F02	ESS-4981029	ESS-4973495	
Selene Guide Carrier 1	..ESTIA.A01.F01.F03	ESS-5918968	ESS-1990367	ESS-5312365
Selene Guide Carrier 2	..ESTIA.A01.F01.F04	ESS-5918969	ESS-1990367	ESS-5312365



Overview Components

Sample Exposure (=ESS.NSS.H01.ESTIA.A02)

Sample Exposure

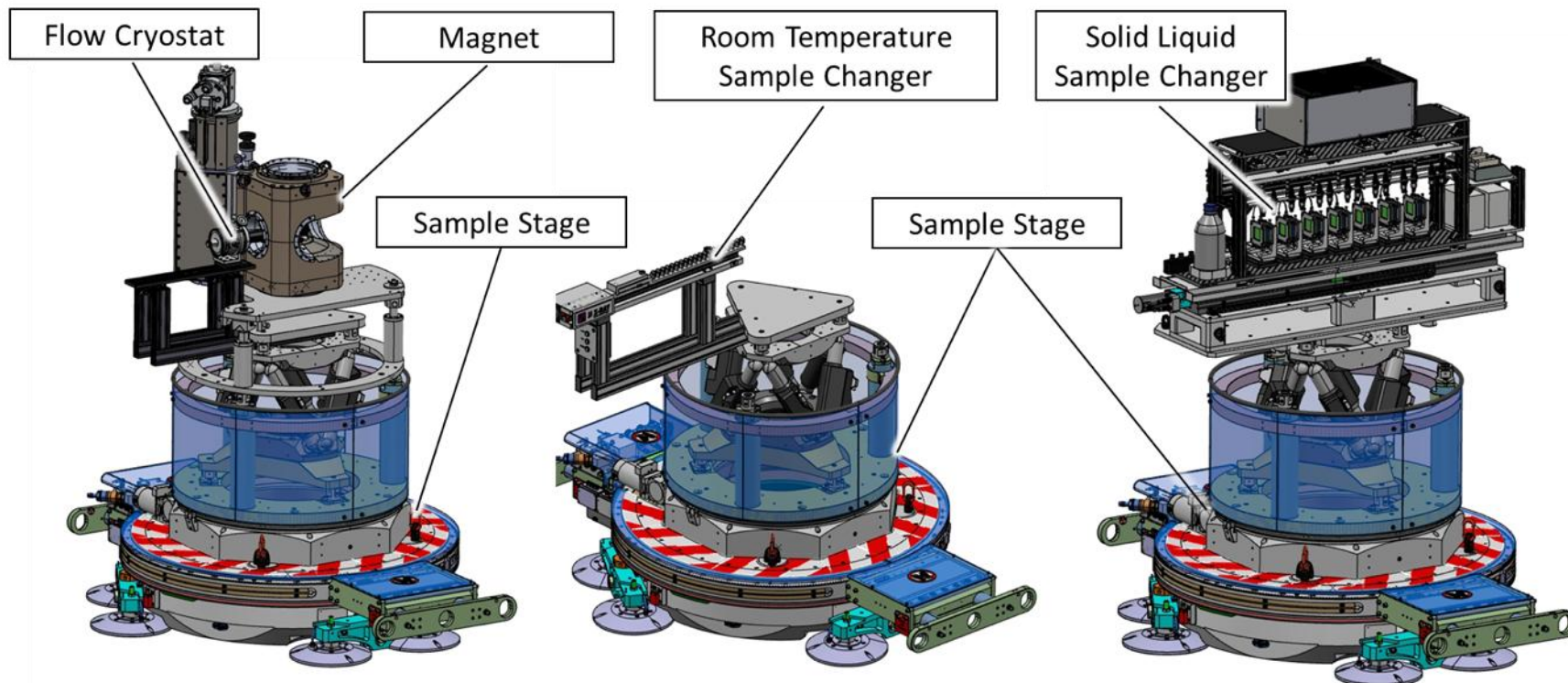
(=ESS.NSS.H01.ESTIA.A02



FBS	Description
=ESS.NSS.H01.ESTIA.A02.U01	Support Structure in Air Pads (L0)
=ESS.NSS.H01.ESTIA.A02.W01	Sample Positioning
=ESS.NSS.H01.ESTIA.A02.AS01	Sample Conditioning

Sample Exposure

(=ESS.NSS.H01.EXTIA.A02)



Sample Exposure

(=ESS.NSS.H01.ESTIA.A02)

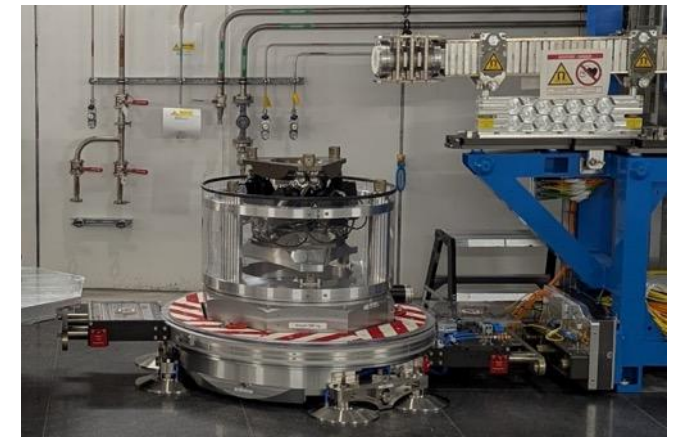
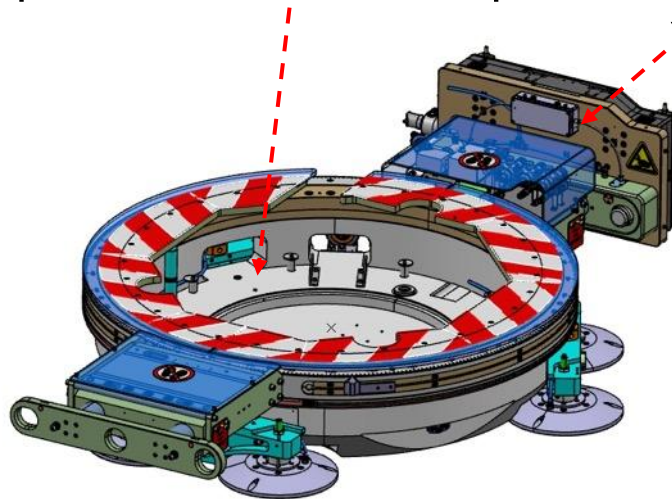
Support Structure on Air Pads (=ESS.NSS.H01.ESTIA.A02.U01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Support Structure on Air Pads	..ESTIA.A02.U01	ESS-5638345	ESS-3918381	ESS-5423296
Y-Adjustment Stage	..ESTIA.A02.U01.WH01	ESS-5693517	ESS-4390088	ESS-5361835

Support Structure on Air pads

Y-Adjustment Stage



Sample Exposure

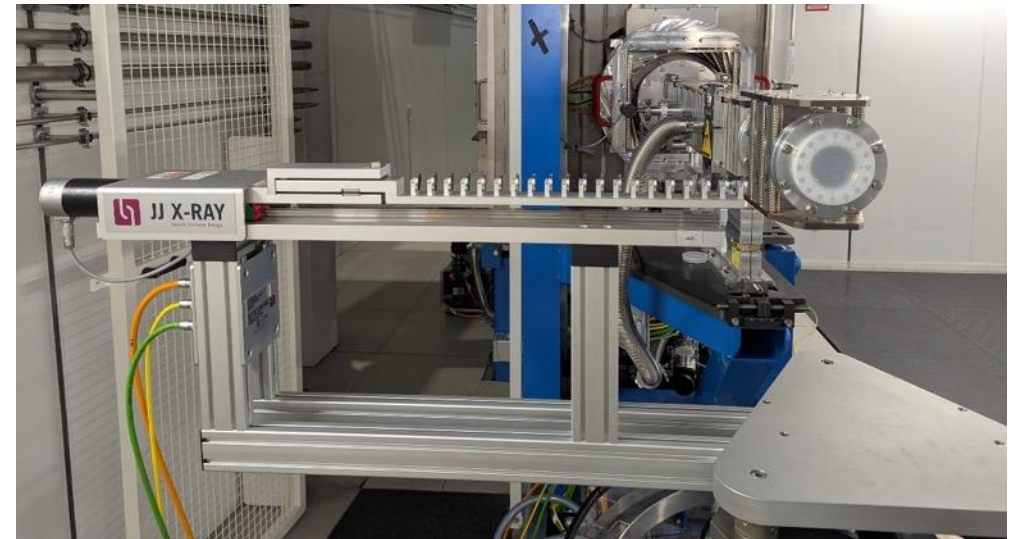
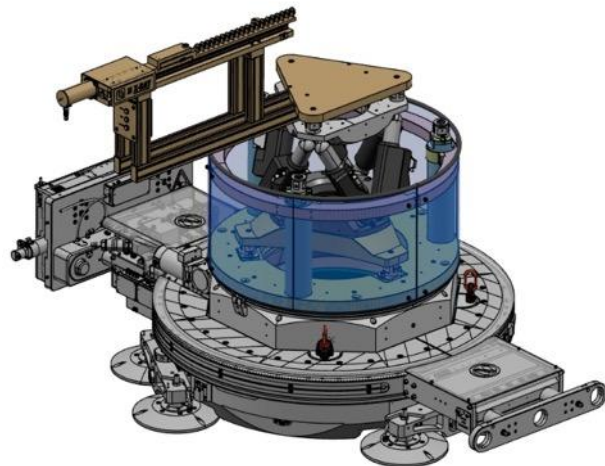
(=ESS.NSS.H01.ESTIA.A02

Sample Positioning

(=ESS.NSS.H01.ESTIA.A02.W01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Sample Rotation Table	..ESTIA.A02.W01.W01	ESS-5692889	ESS-3918382	ESS-5423296
Sample Hexapod	..ESTIA.A02.W01.GM01	ESS-5692885	ESS-4934154	ESS-5423296
Room Temperature Sample Changer	..ESTIA.A02.W01.W02	ESS-5669715	Ess-5801973	ESS-5670013



Sample Exposure

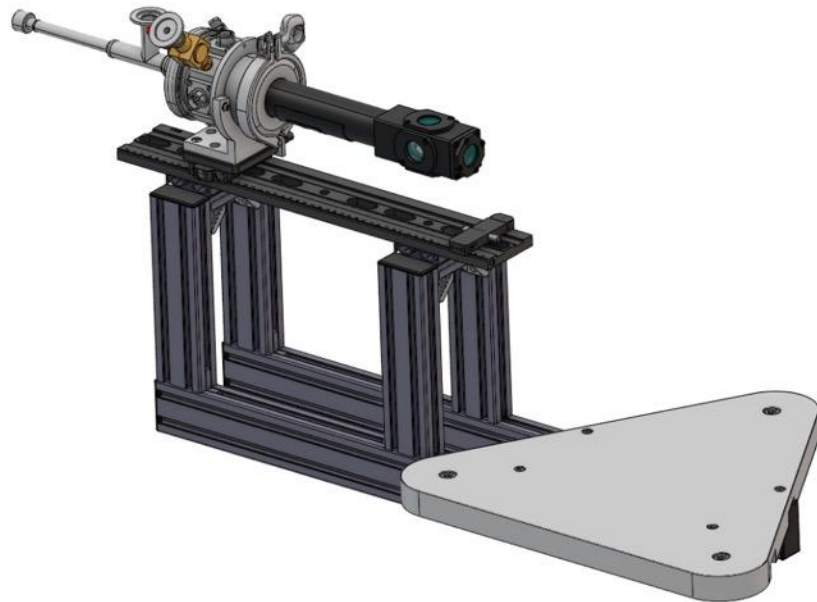
(=ESS.NSS.H01.ESTIA.A02)

Sample Conditioning

(=ESS.NSS.H01.ESTIA.A02.AS02)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Flow Cryostat Support	..ESTIA.A02.AS02.U01	ESS-5847478	ESS-5829767	ESS-5376480
Low Cryostat	..ESTIA.A02.AS02.R01	ESS-5796536	ESS-5829923	ESS-5376480

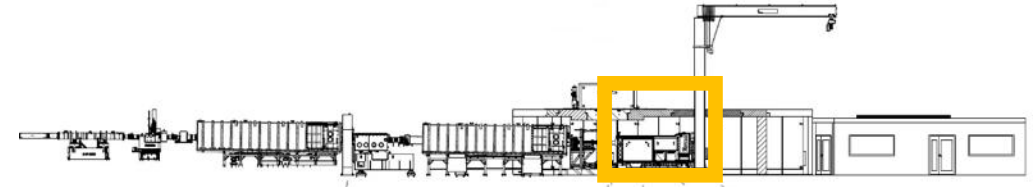


Overview Components

**Scattering Characterization System
(=ESS.NSS.H01.ESTIA.B01)**

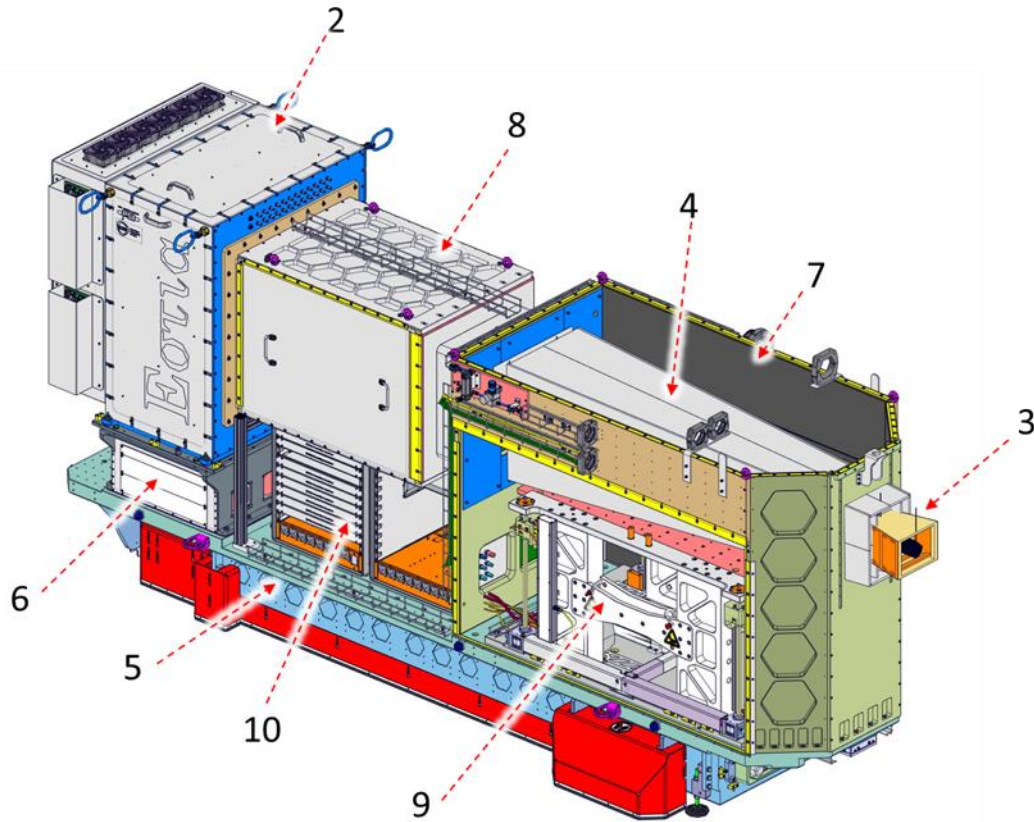
Scattering Characterization System

(=ESS.NSS.H01.ESTIA.B01)



FBS	Description
=ESS.NSS.H01.ESTIA.B01.B01	Neutron Detector System
=ESS.NSS.H01.ESTIA.B01.B02	Polarisation Analyser System
=ESS.NSS.H01.ESTIA.B01.C01	Neutron Detector Electronics
=ESS.NSS.H01.ESTIA.B01.C02	Detector Tank System
=ESS.NSS.H01.ESTIA.B01.U01	Detector Arm Support on Air Pads
=ESS.NSS.H01.ESTIA.B01.U02	Cabel Support/Boom
=ESS.NSS.H01.ESTIA.B01.W01	Flight Tube

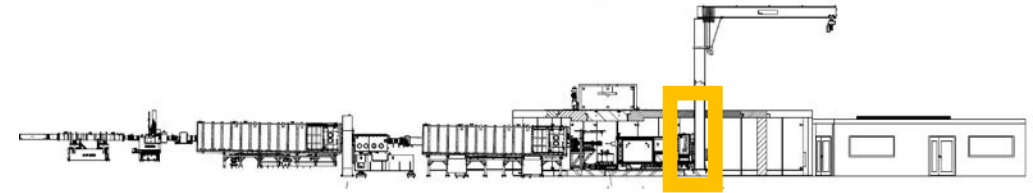
Scattering Characterization System (=ESS.NSS.H01.ESTIA.B01)



Scattering Characterization System

(=ESS.NSS.H01.ESTIA.B01)

Detector



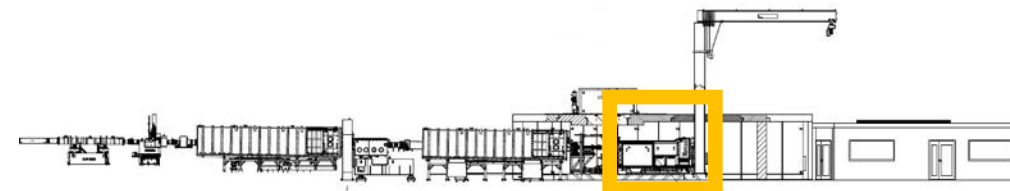
System name	FBS	EPL	CAD-Design	SSDD/TDD
Neutron Detector System	..ESTIA.B01.B01	ESS-5526251	ESS-5473820	ESS-5487413
Neutron Detector Electronics	..ESTIA.B01.C01	ESS-5289585	N/A	ESS-5487413
Detector Tank System	..ESTIA.B01.C02	ESS-5523801	ESS-5611251	ESS-5487413

Detailed described in the Talk Detector and Beam Monitor



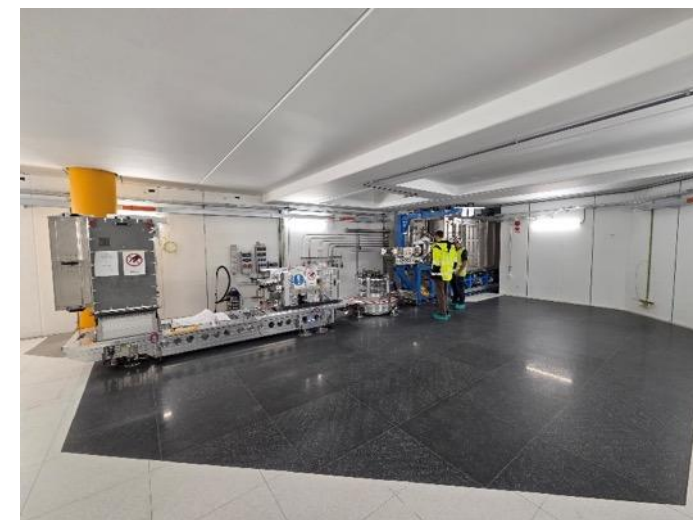
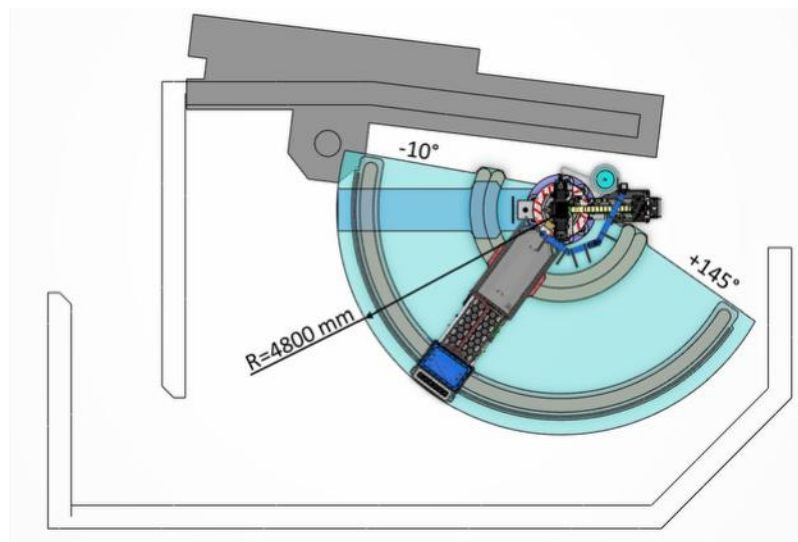
Scattering Characterization System

(=ESS.NSS.H01.ESTIA.B01)



Detector Arm

System name	FBS	EPL	CAD-Design	SSDD/TDD
Support Structure on Air Pads	..ESTIA.B01.U01	ESS-5526241	ESS-3627991	ESS-5423297
Flight tube	..ESTIA.B01.W01	ESS-5523804	ESS-4007891	ESS-5423297
Cable Support/Boom	..ESTIA.B01.U02	ESS-5524857	ESS-5691530	ESS-5423297



Scattering Characterization System

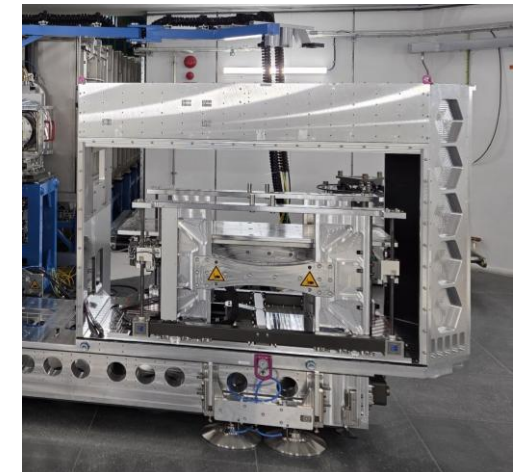
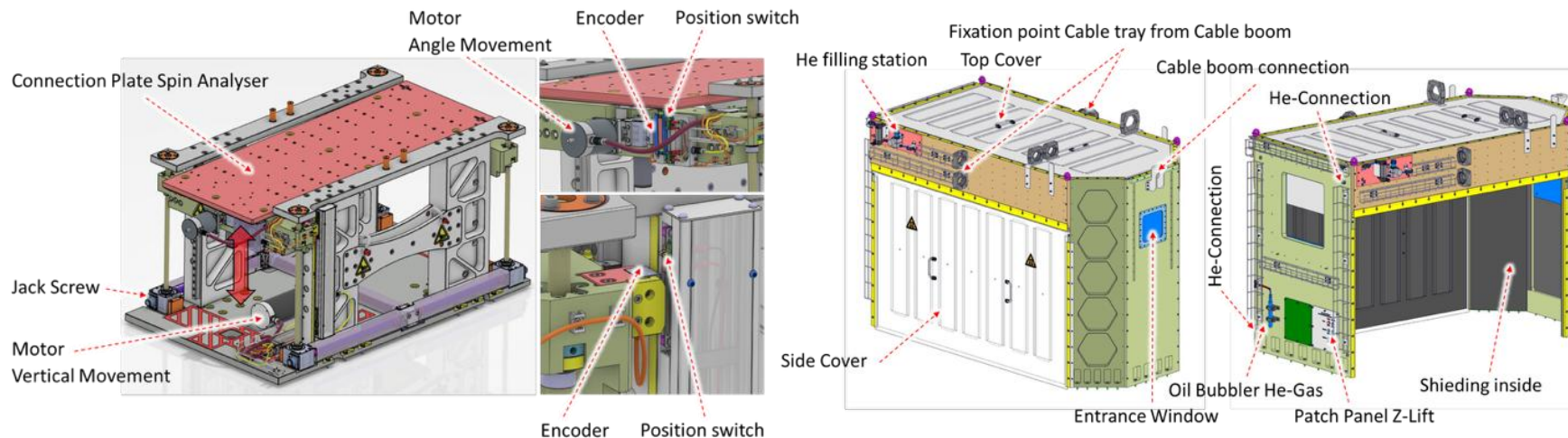
(=ESS.NSS.H01.ESTIA.B01)



Polarisation Analyser System (=ESS.NSS.H01.ESTIA.B01.B02)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Polarisation Analyser	..ESTIA.B01.B02.B01	ESS-5693590	N/A	N/A
Spin Flipper 2	..ESTIA.B01.B02.T01	ESS-5523846	N/A	N/A
Analyser Tank	..ESTIA.B01.B02.C01	ESS-5523845	ESS-4016243	ESS-5423297
Analyser in-Beam Positioning	..ESTIA.B01.B02.W01	ESS-5693589	ESS-3861885	ESS-5423297

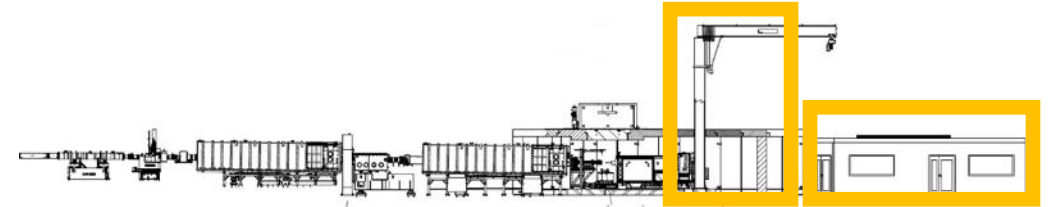


Overview Components

Support System(=ESS.NSS.H01.ESTIA.A04)

Support System

(=ESS.NSS.H01.ESTIA.A04)



Detector Arm

System name	FBS	EPL	CAD-Design	SSDD/TDD
Local Crane	=ESS.NSS.H01.ESTIA.A04.GM01	ESS-4980196	ESS-4973498	ESS-4940032
Control Hutch	=ESS.NSS.H01.ESTIA.A04.U01	ESS-3873749	ESS-4023251	ESS-4894763
Sample Preparation Facility	=ESS.NSS.H01.ESTIA.A04.A02	ESS-3873749	ESS-4023251	ESS-4894763

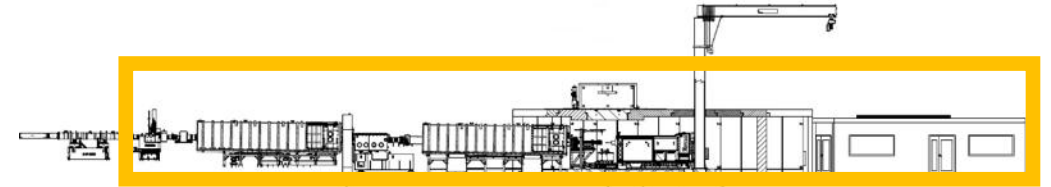


Overview Components

Supply System (=ESS.NSS.H01.ESTIA.A05)

Supply System

(=ESS.NSS.H01.ESTIA.A05)

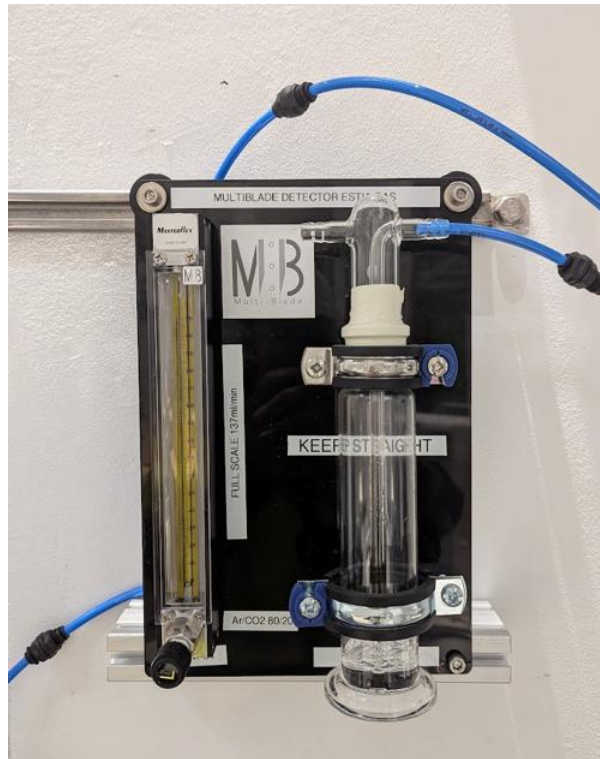


System name	FBS	EPL	CAD-Design	SSDD/TDD
Detector Gas System	=ESS.NSS.H01.ESTIA.A05.W04		N/A	ESS-3482657
Beam monitor gas system	=ESS.NSS.H01.ESTIA.A05.W03		N/A	ESS-3482657
Process Utilities	=ESS.NSS.H01.ESTIA.A05.W02		N/A	ESS-3482657
Electrical Power & Grounding	=ESS.NSS.H01.ESTIA.A05.W01		N/A	ESS-3963021
Gas mixing system – detectors	=ESS.NSS.H01.ESTIA.A05.Q02		N/A	N/A
Timing system	=ESS.NSS.H01.ESTIA.A05.K01		N/A	ESS-5856024

Supply System (=ESS.NSS.H01.ESTIA.A05)



Gas mixing system –
detectors



=ESS.NSS.H01.ESTIA.A05.Q02

Process Utilities



=ESS.NSS.H01.ESTIA.A05.W02

Electrical Power & Grounding



=ESS.NSS.H01.ESTIA.A05.W01

Overview Components

Vacuum System (ESTIA) (=ESS.NSS.H01.ESTIA.G01)

Vacuum System

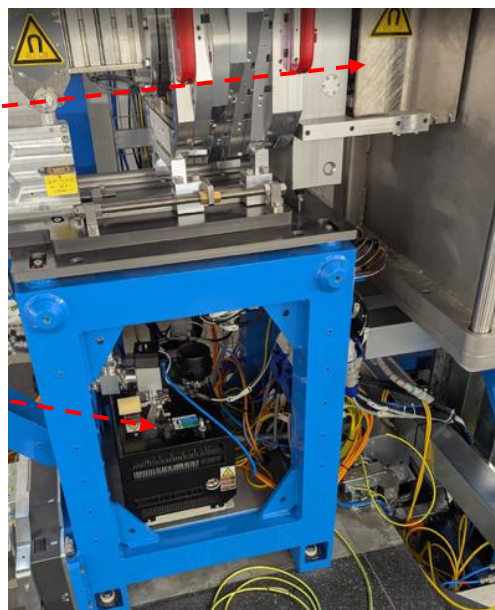
(=ESS.NSS.H01.ESTIA.G01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
ESTIA Vacuum System Bunker Zone	=ESS.NSS.H01.ESTIA.G01.G01	ESS-5359888	NA	ESS-2169859
ESTIA Vacuum System Instrument Zone	=ESS.NSS.H01.ESTIA.G01.G02	ESS-5275767	NA	ESS-2169859

Selene guide 2
gate valve

Vacuum pump
in cave

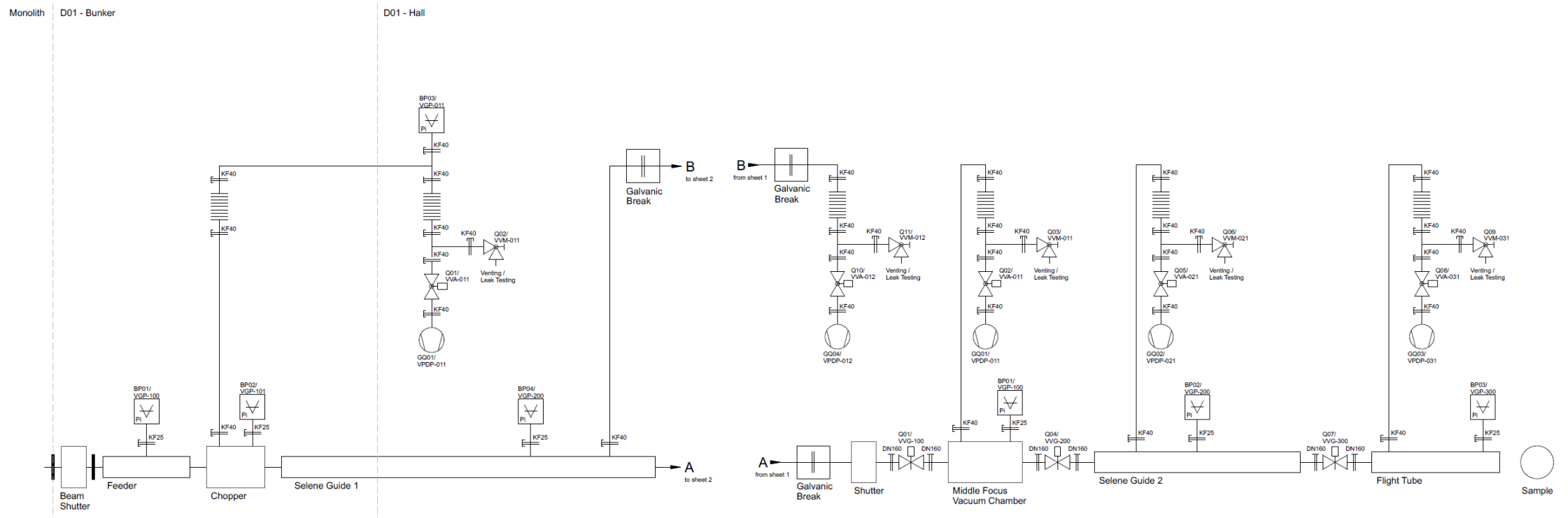


Vacuum pump
Selene guide 1

Vacuum pump
middle focus



Vacuum System (=ESS.NSS.H01.ESTIA.G01)



Overview Components

Experimental Cave (=ESS.NSS.H01.ESTIA.U01)

Experimental Cave

(=ESS.NSS.H01.ESTIA.U01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Bosch Rexroth rack frames with isolators	=ESS.NSS.H01.ESTIA.U01.U03	ESS-5716250	ESS-5759314	ESS-5633162
Cave Structure	=ESS.NSS.H01.ESTIA.U01.U01	ESS-4980155	ESS-0048145	ESS-4894763
Cave Door	=ESS.NSS.H01.ESTIA.U01.QQ01	ESS-5482684	ESS-0048145	ESS-4894763
False Floor ESTIA Middle Focus	=ESS.NSS.H01.ESTIA.U01.ND04	ESS-5545623	ESS-5585072	ESS-5633162
False Floor ESTIA Selene Guide 2	=ESS.NSS.H01.ESTIA.U01.ND03	ESS-5545622	ESS-5585072	ESS-5633162
False Floor ESTIA Shielding Wall	=ESS.NSS.H01.ESTIA.U01.ND02	ESS-5545621	ESS-5585072	ESS-5633162
False Floor ESTIA Cave Wall	=ESS.NSS.H01.ESTIA.U01.ND01	ESS-5446314	ESS-5585072	ESS-5633162
Shielding on Cave	=ESS.NSS.H01.ESTIA.U01.F01	ESS-5162564	ESS-0048145	ESS-4894763
Roof Hatch	=ESS.NSS.H01.ESTIA.U01.A02	ESS-4980186	ESS-0048145	ESS-4894763

Experimental Cave (=ESS.NSS.H01.ESTIA.U01)



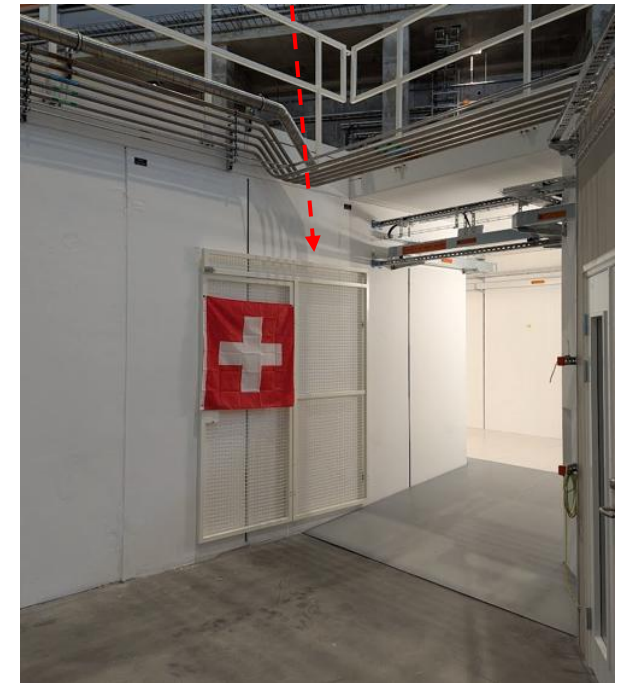
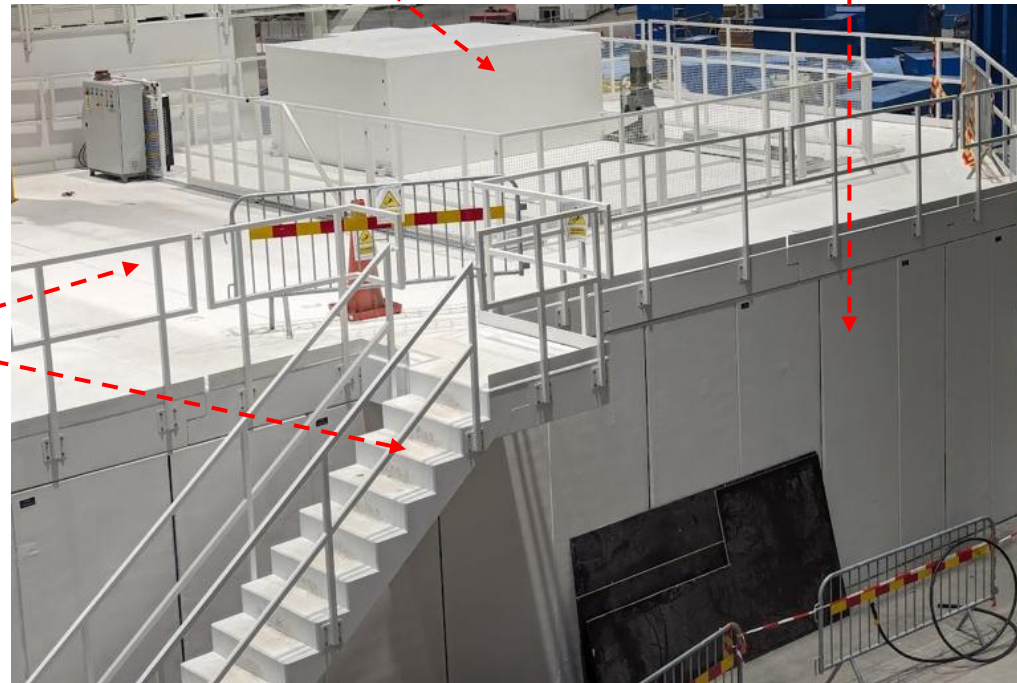
Bosch Rexroth rack frames with isolators



Roof hatch

Shielding on cave

Cave door



Cave Structure

Experimental Cave (=ESS.NSS.H01.ESTIA.U01)

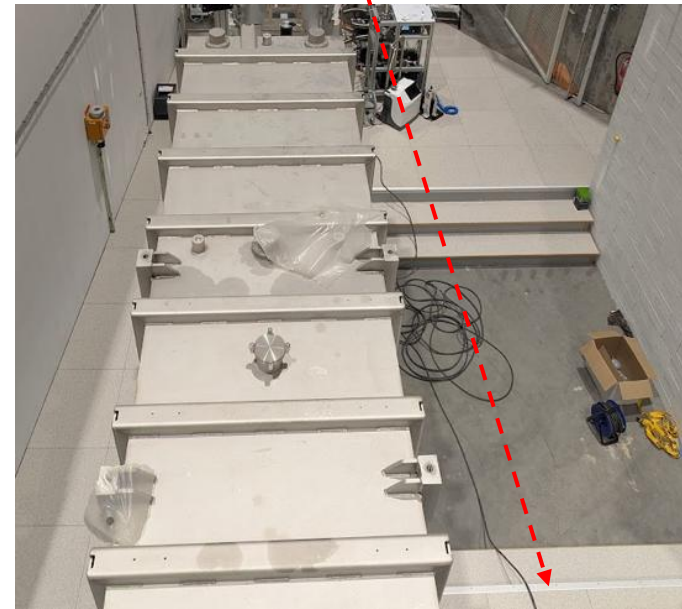
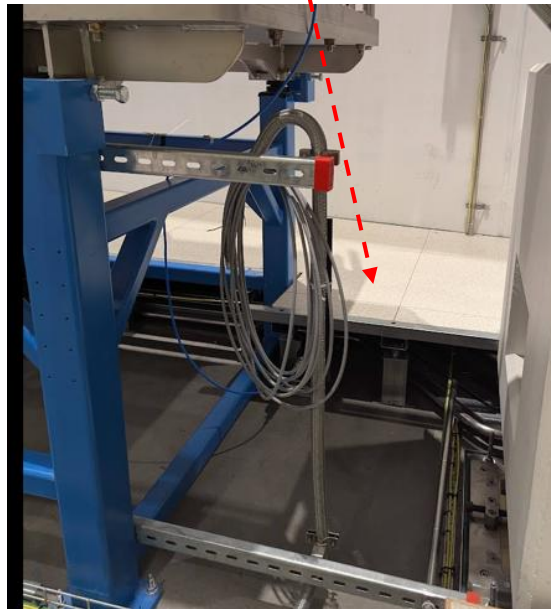
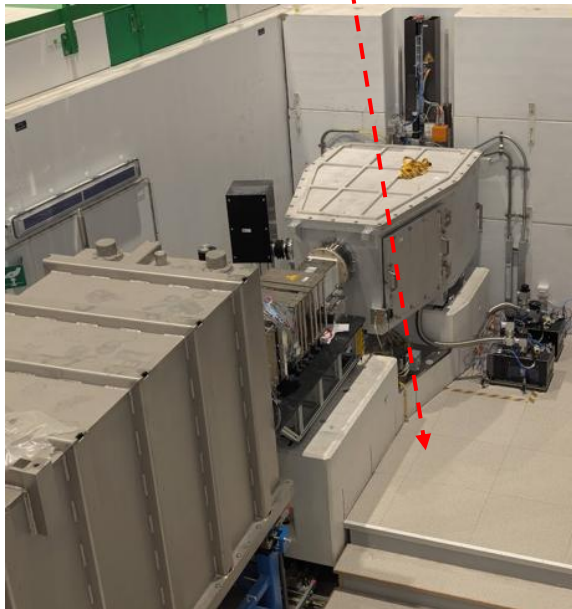


False floor ESTIA Selene guide 2

False floor ESTIA cave wall

False floor ESTIA Middle Focus

False floor ESTIA shielding wall

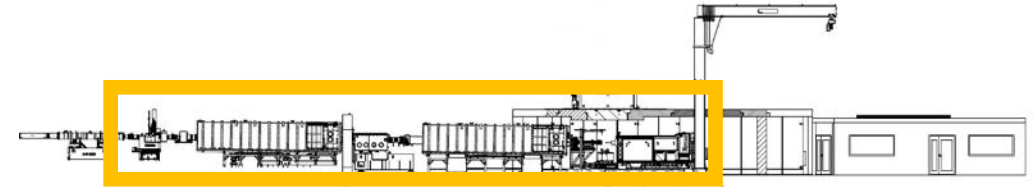


Overview Components

**Instrument Automation Control System
(=ESS.NSS.H01.ESTIA.K01)**

Instrument Automation Control System

(=ESS.NSS.H01.ESTIA.K01)



System name	FBS	EPL	CAD-Design	SSDD/TDD
ESTIA Motion Control 1 (Virtual Source)	=ESS.NSS.H01.ESTIA.K01.K01	ESS-5494023		ESS-5516370
ESTIA Motion Control 2 (Selene Guide 1)	=ESS.NSS.H01.ESTIA.K01.K02	ESS-5494024		ESS-5516370
ESTIA Motion Control 3 (Shutter & Middle Focus)	=ESS.NSS.H01.ESTIA.K01.K03	ESS-5275771		ESS-5516370
ESTIA Motion Control 4 (Selene Guide 2)	=ESS.NSS.H01.ESTIA.K01.K04	ESS-5275770		ESS-5516370
ESTIA Motion Control 5 (Sample & Detector)	=ESS.NSS.H01.ESTIA.K01.K05	ESS-5275772		ESS-5516370
ESTIA Hexapod and other Automation Control	=ESS.NSS.H01.ESTIA.K01.K06	ESS-5494025		ESS-5722139

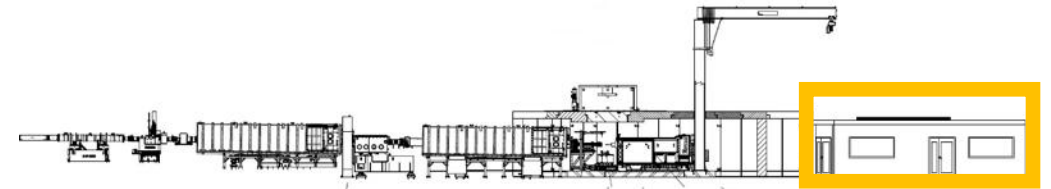
Detailed described in the presentation Motion Control and Automation

Overview Components

**Data Management & Experiment Control System
(=ESS.NSS.H01.ESTIA.K02)**

Data Management & Experiment Control System

(=ESS.NSS.H01.ESTIA.K02)



System name	FBS	EPL	CAD-Design	SSDD/TDD
Data Analysis	=ESS.NSS.H01.ESTIA.K02.K01	N/A	N/A	N/A
Data Reduction	=ESS.NSS.H01.ESTIA.K02.K02	N/A	N/A	N/A
Data Curation	=ESS.NSS.H01.ESTIA.K02.K03	N/A	N/A	N/A
Experiment Control	=ESS.NSS.H01.ESTIA.K02.K04	N/A	N/A	N/A

Data analysis



Data reduction



Data curation



Experiment control



Overview Components

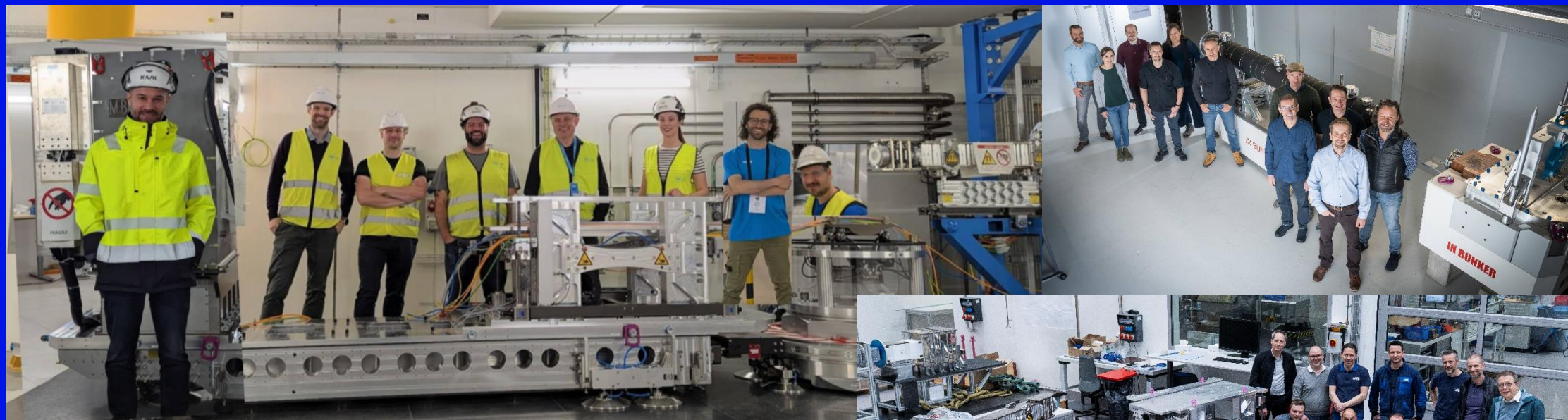
Personnel Safety System (ESTIA PS) (=ESS.NSS.H01.ESTIA.U01)

Personnel Safety System (=ESS.NSS.H01.ESTIA.U01)



**Detailed described in the presentation Personnel safety System
in iSRR later**

Thank you for your attention



And thanks to all the team members during this project

