Feedback from First Collimator Alignments

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On behalf of the LHC Collimation team

Overview of Alignment Activities

- Sunday 24/05: 8 hour shift
  - Course setup at injection with BLMs
  - BPM alignments - follow-up from beam test

- Monday 25/05:
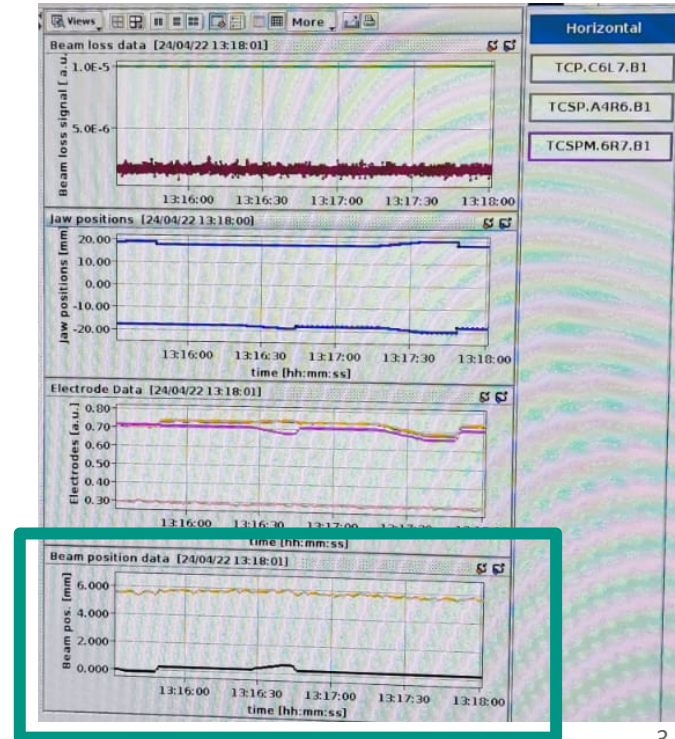 - Course setup at flat top with BLMs
    - (without TCTs)

Coarse settings

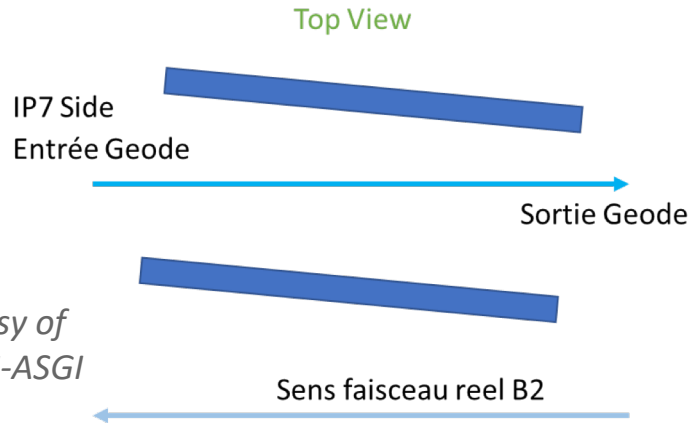| Collimator	IR	Inj.	FT
TCP (H/V)	7	8 σ	20 σ
TCSP	6	10 σ	25 σ
TCP	3	12 σ	30 σ
TCT	1/2/5/8	±15 mm	±15 mm
Others at parking	-	-	-

Alignment Outcome

- Automatic Alignment minor issues:

  - **Resolved:** Machine learning config issue

  - **Resolved:** UI issue with alignment settings

  - **Resolved:** Flat top config issue

- BPMs: (3 missing TCSPM alignments post beam test)

  - **Aligned:** TCSPM.D4R7.B2 missing BPM mapping (SY-BI)

  - **Aligned:** TCSPM.E5L7.B2 alignment inversion

  - **TODO:** TCSPM.6R7.B1 large offset in electrode signals (SY-BI)

New release of FESA + Java apps

Alignment Outcome - Collimator Jaw Tilts Issue

- Asymmetries observed in upstream and downstream centres post alignments:

  - Quick angular alignment resulted in TCP.C6R7.B2: Left jaw: +400 µrad, Right jaw: -700 µrad

    - Misalignment confirmed (SY-STI) -> Access this afternoon

  - 4 hours morning shift ongoing to collect data on TCP and other suspicious collimators

Top View

IP7 Side
Entrée Geode

Sortie Geode

*Courtesy of
BE-GM-ASGI*

Sens faisceau reel B2

			Beam Test 2021		Commissioning 2022	
	Up centre	Down centre	Up/Down diff	BPM alignment date	Up/Down diff	BLM alignment Date
BEAM 1						
TCTPH.4L5.B1	-0.74	-0.375	**0.365**	26-Oct	**-0.3**	24-Apr
TCSPM.B4L7.B1	-0.29	0.075	**0.365**	26-Oct	**-0.49**	24-Apr
TCP.C6L7.B1	0.4875	0.395	**-0.0925**	26-Oct	**0.22**	24-Apr
TCTPV.4L2.B1	1.035	0.4	**-0.635**	26-Oct	**0.46**	24-Apr
TCTPV.4L8.B1	-0.33	0.03	**0.36**	26-Oct	**-0.26**	24-Apr
TCSG.D4L7.B1	-0.465	-0.28	**0.185**	26-Oct	**-0.36**	24-Apr
TCP.D6L7.B1	0.185	-0.045	**-0.23**	26-Oct	**0.24**	24-Apr
TCSPM.E5R7.B1	-0.27	0.04	**0.31**	29-Oct	**-0.23**	24-Apr
BEAM 2						
TCTPH.4R8.B2	-0.875	-0.445	**0.43**	26-Oct	**-0.28**	24-Apr
TCTPH.4R2.B2	0.2225	-0.1875	**-0.41**	26-Oct	**0.51**	24-Apr
TCSP.A4L6.B2	-0.54	-0.935	**-0.395**	26-Oct	**0.38**	24-Apr
TCP.C6R7.B2	-0.74	-0.005	**0.735**	28-Oct	**-0.74**	24-Apr
TCTPV.4R1.B2	-0.07	-0.18	**-0.11**	26-Oct	**-0.29**	24-Apr
TCTPV.4R5.B2	0.405	-0.045	**-0.45**	26-Oct	**-0.34**	24-Apr