TCDI/TDI setting up

Preliminary conclusions

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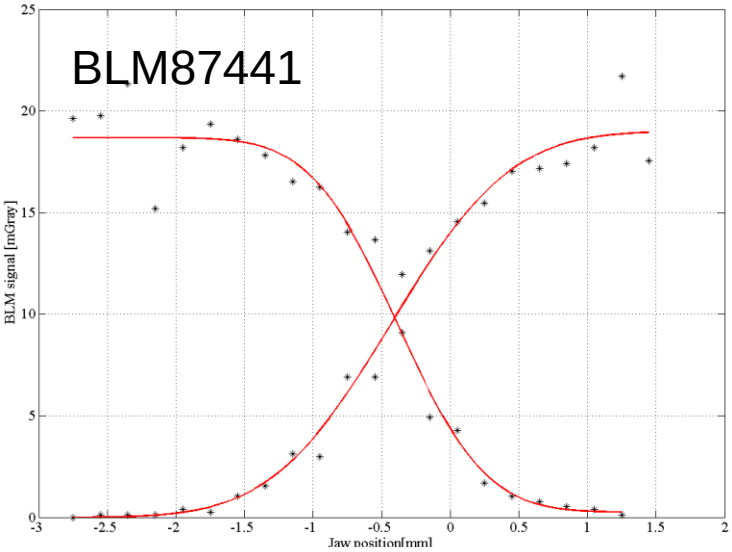
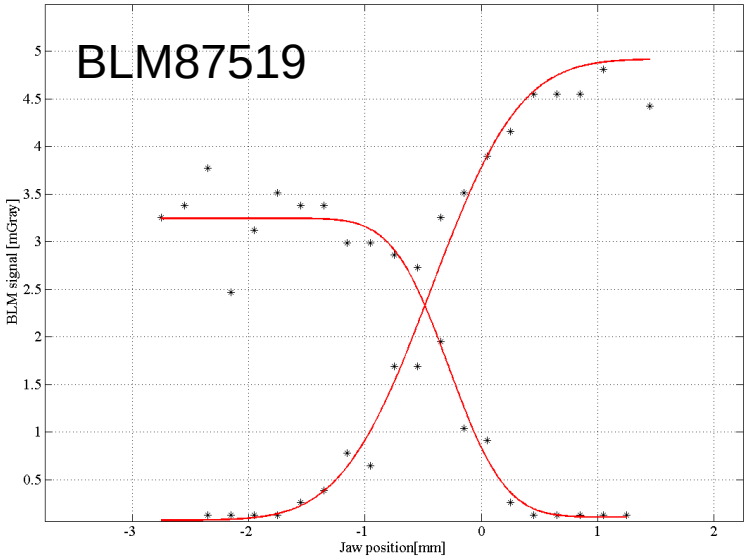
TCDI setting up

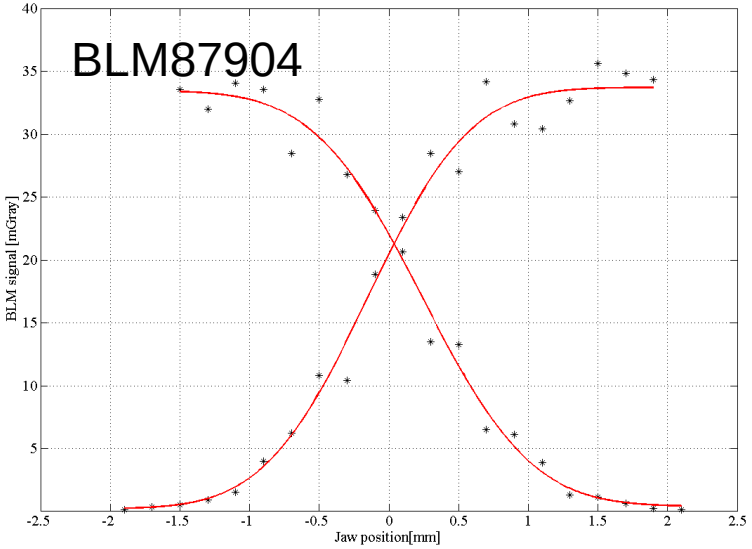
- TI 8/B2, 13:37 to 18:32 on 25/10/09, single bunch, 4e9 p+
- Made centering scans for all 6 jaws of TCDIH in TI8
  - Set jaw to position calculated by YASP, then made ±1 mm step
  - Centered each jaw with scan across beam
  - Agreed v.well with YASP (<0.1 mm), except for 88121 (0.4 mm error)
- Set TCDIH to 4.5 σ around measured beam centre
- Process takes maybe 1 hour per TCDI, with ~5e9 p+

Collimator	Sigma [mm]	Centre [mm]	YASP [mm]	BLM
TCDIH.87441	0.42	-0.41	-0.75	87441
	0.35	-0.36	-0.75	87519
TCDIH.87904	0.42	0.04	0.1	87904
	0.34	0.08	0.1	88123
TCDIH.88121	0.72	0.84	0.5	88123
	0.64	0.80	0.5	88126
	0.59	0.81	0.5	88143

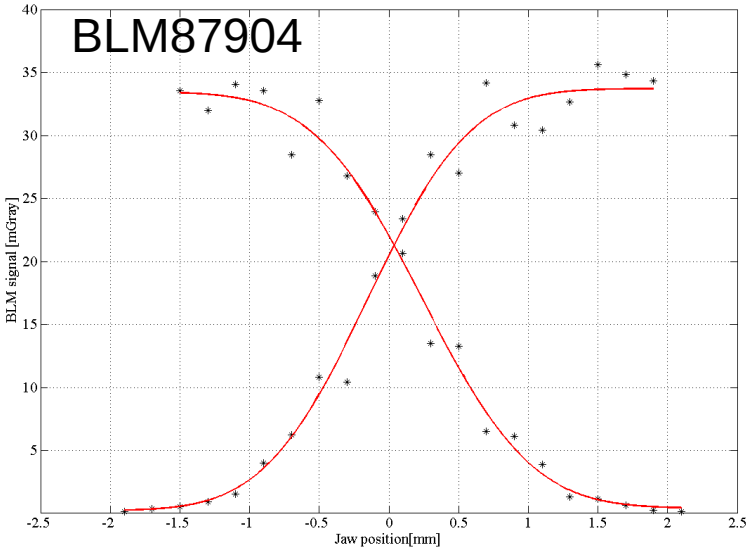
Scans TCDIH.87441

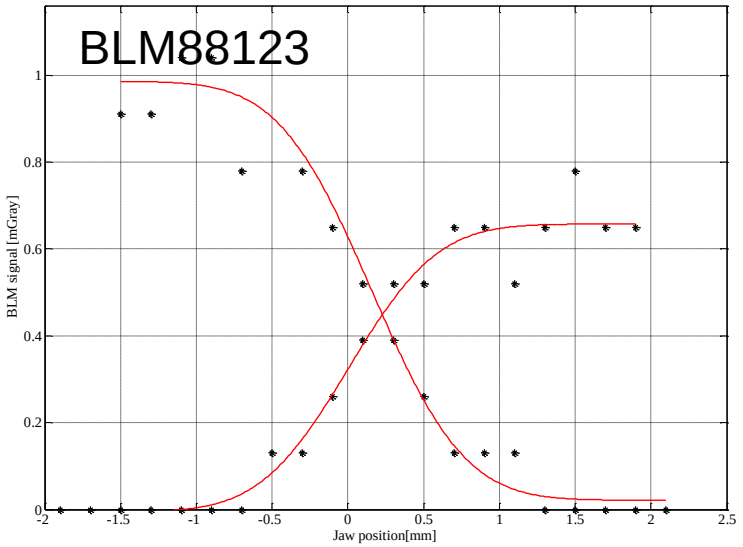




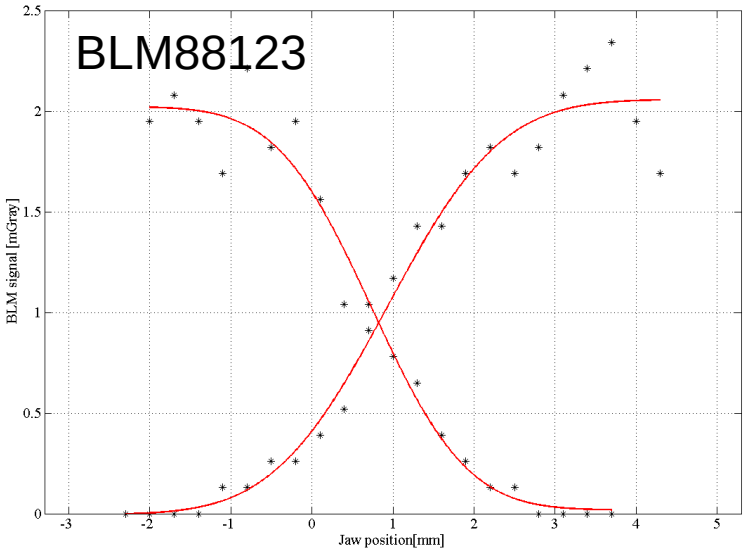


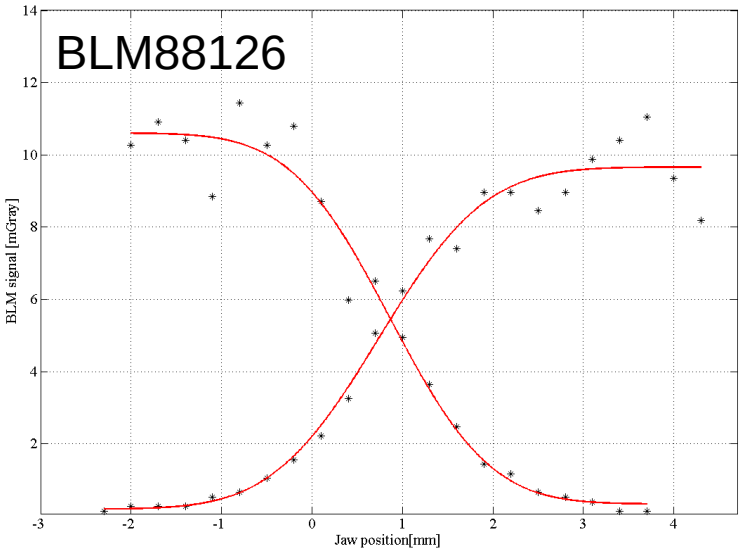
Scans TCDIH.87904

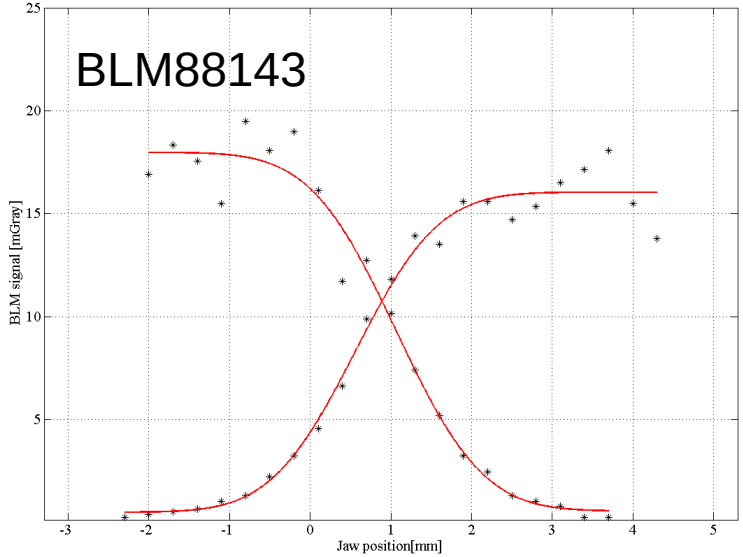




Scans TCDIH.88121

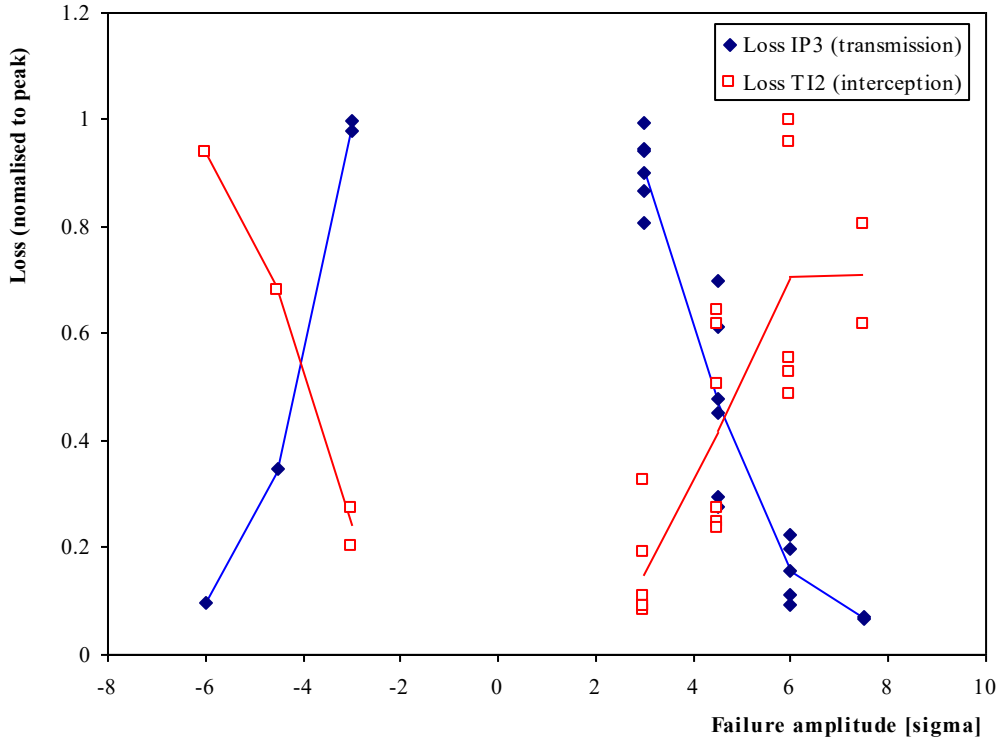






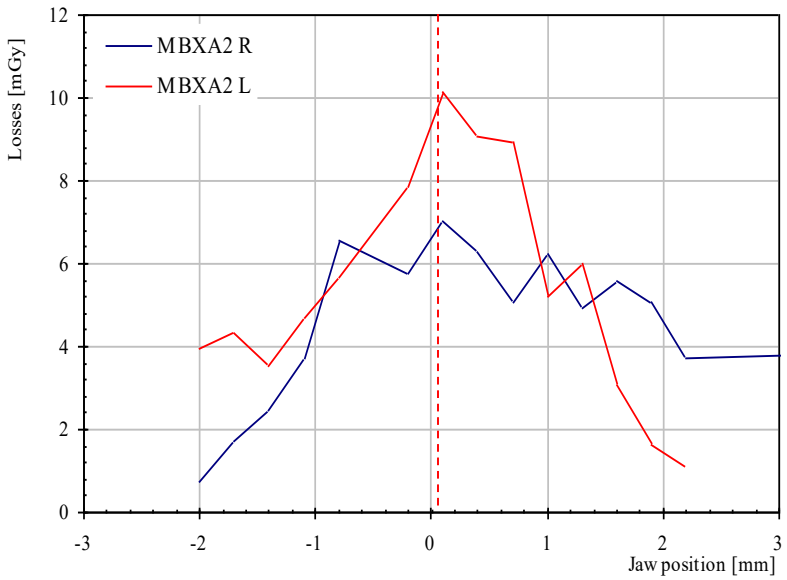
TCDI setting up - checking

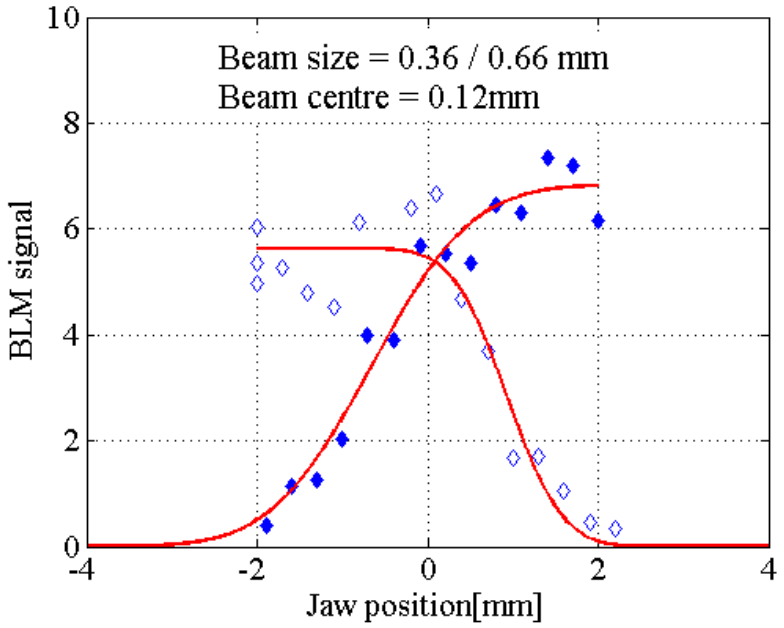
- Scanned TCDIH with upstream bump (“failure”) at different phases
  - Measured beam loss on IR7 collimators as function of bump amplitude
- Set beam to 6 σ offset then scanned transmission with IR7 collimators
- Tail scan data still being analysed



Basic TDI setup (for MKI measurement)

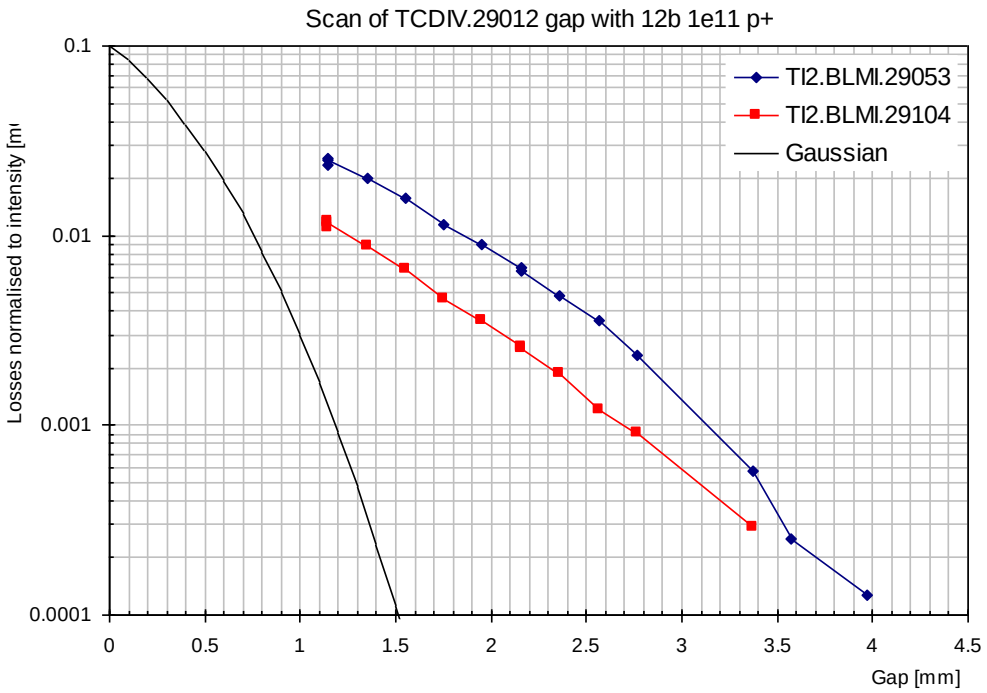
- Put TDI IN beam at ‘tight’ settings to protect downstream against likely losses from moving beam around with MKI kick
- Scanned each TDI jaw across beam
  - ALICE muon chamber issue…to address.
  - Centering from TDI BLMs needs more work – note big signal in D1





Beam losses during injection

- Tail scan with ~1.2e11 p+ (in TI2 09/09)
- Jaws set around derived beam centre, opened in steps
- Significant exponential beam tails… losses of 5-10% at 4.5 sigma!
- Data also to analyse from last weekend with all TCDIH at 4.5 sigma
- Need to work on this
  - Emittance from injectors, scrapers, …



Conclusion

- Protection device setting up started for real
  - Centering procedure looks good with ~5e9 p+
  - Beam sizes look reasonable, trajectory interpolation works
  - TCDIs
    - Have identified beast BLMs to use
    - Losses from tails a concern – to work on
    - Protection levels – methods to measure this tested, needs work
  - TDIs
    - More careful measurements needed
  - BLM saturation causes problems
    - Renders scans non-linear
    - Any fix? SEMs??