

Exploring long L^* option at ATF2

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OUTLINES

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Motivations for long L^* study at ATF2

CLIC IR design converge toward the **long L^* for the FFS** :

Announced changes to the detector model

- The detector team has decided to concentrate for the time being on a **single** detector with all-silicon tracking.

No more push-pull

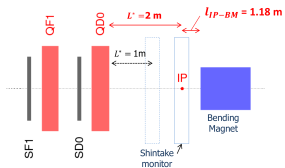
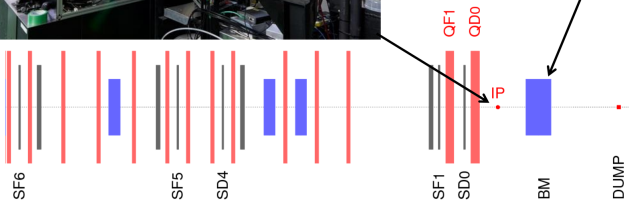
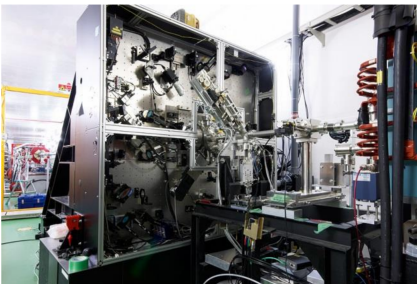
- A number of **parameters have been** frozen to allow consistent studies on detector optimisation and performance.
- For the forward region design they concentrate now on the long L^* solution with **QDO in the tunnel**, i.e. outside the detector.
The exact value of L^* has been defined as 6 m.

This has major implications for MDI

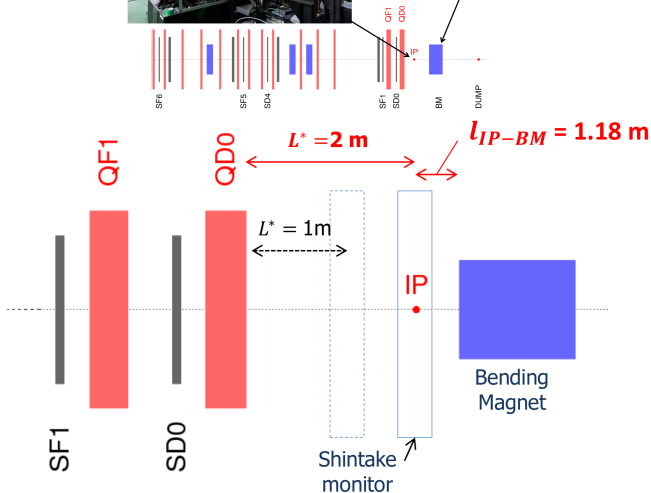
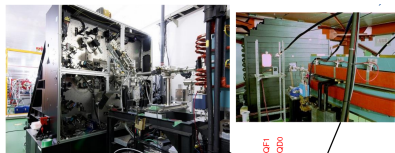


- Several points need to be proved experimentally to check its feasibility :
 - Chromaticity correction at the IP
 - TUNING
 - Stabilization of the beam to the nanometer level at the IP
 - Influence of wakefields
 - Impact of ground motion on the beam size

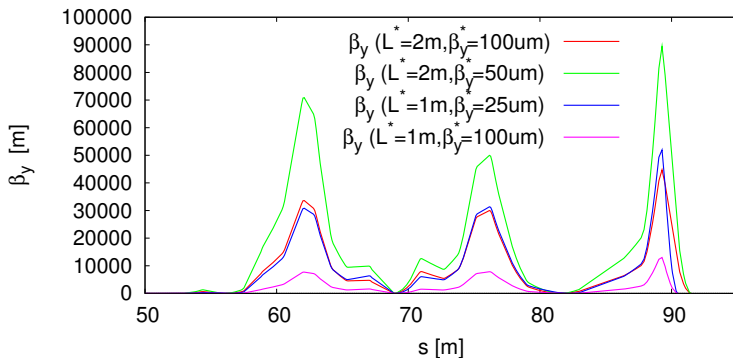
Technical changes : moving the Shintake monitor



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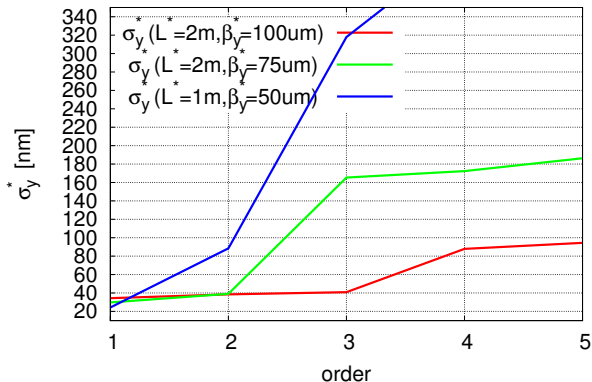
Optics design comparison



	L^* (m)	β_y^* (mm)	β_y^{QD0} (m)	ξ_y
CLIC 3TeV	3.5	0.07	175 000	50000
CLIC 3TeV	6	0.12	300 000	50000
ATF2	1	0.1	10 000	10 000
ATF2	1	0.025	40 000	40 000
ATF2	2	0.1	40 000	20 000
ATF2	2	0.05	80 000	40 000

Status of long L^* performance (preliminary)

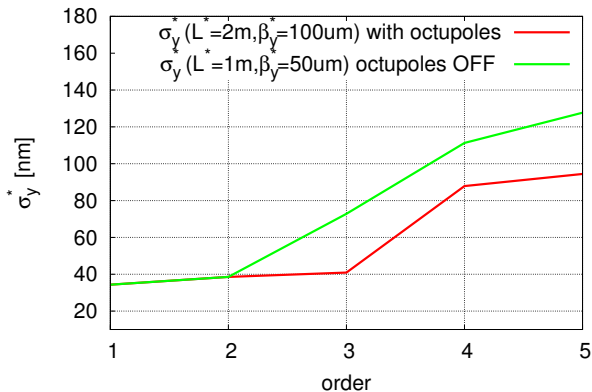
- After matching the desired twiss parameters, normal and skew sextupoles and octupoles were optimized to minimize the beam size



- Optics design optimization is not done yet and should continue
- Present status shows very preliminary chromatic and high order aberrations correction
- No time for deeper study on nonlinear optics

Status of long L^* performance (preliminary)

- One can expect that the use of the octupoles will be necessary for long L^* study



Summary

- Long L^* option is in very early stage and present result should not be taken as definitive performances
- This configuration is very challenging from technical and optics design point of view
- It can be very interesting to have experimental proof of feasibility for the long in the long term plan of ATF2 :
 - Chromaticity correction
 - tuning
 - IP beam stabilization to nanometer level
 - Ground motion feedforward impact for longer L^*