

Extraction line orbit correction / Feedback

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ATF2 commissioning
30 July 2008



Description of the task

It is needed to :

- Simulate ATF2 with agreed errors (e.g. list by G. White).
- Analyze the effects on the stability and the size of the beam.
- Development of several algorithms (e.g. "1 to 1", "dispersion free").
- Compare the results of all.
- Implement the best ones in the Flight Simulator.
- Explicit reconstruction and control of the orbit (specially in QM7)
- Make GUI and User's guide.
- Study the FB implementation, interactions with others.



People involved

People who expressed their interest :

- Y. Renier - LAL (task leader)
- J.R. Lopez - Oxford University
- G. White - SLAC
- A. Scarfe - Manchester & Cocroft Institute
- K. Kubo - KEK

If someone has been omitted or is interested, please contact me.



Status of my work

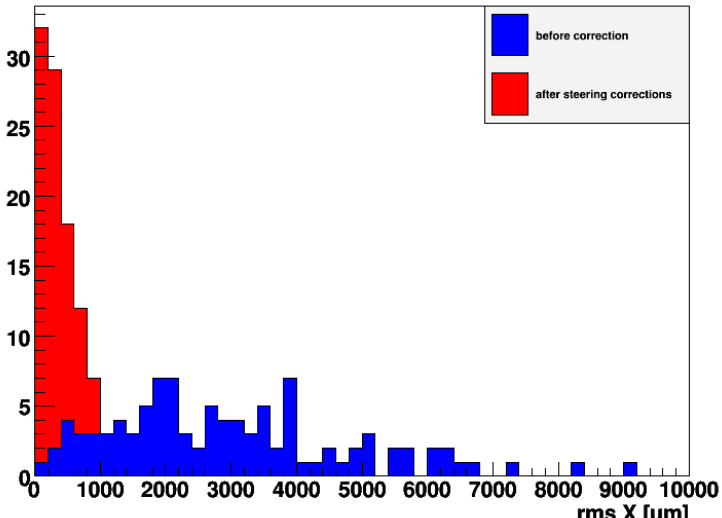
My on-going work on this task

- static magnets' misalignment and rolls and BPMs' resolution.
- 11 bits corrector power supplies.
- implementation of "1 to 1" method using SVD for EXT+FF.
- include correction moving quadrupoles in FF.
- specific treatment of correctors' saturation.
- attempt to make orbit reconstruction and control in QM7 (ATF).



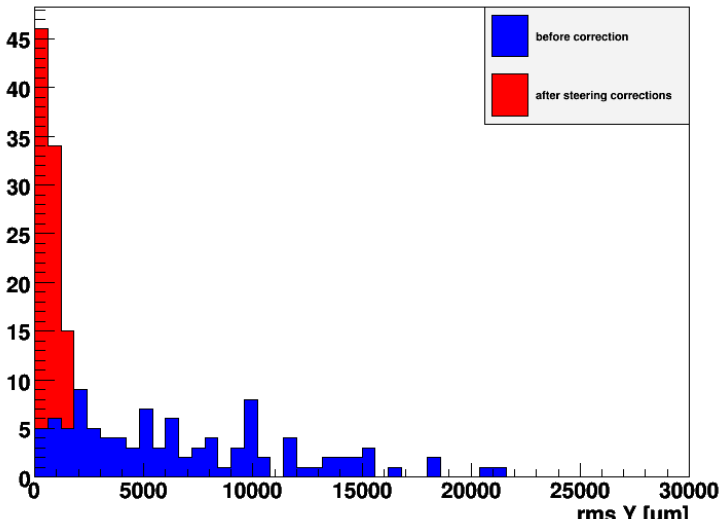
X steering for 30 μm misalignments

rms X bpm readings before and after 1-to-1 correction



Y steering for 30 μm misalignments

rms Y bpm readings before and after 1-to-1 correction



Status of my work

My plan

- many iterations needed with low gain : optimize it.
- several seeds diverge for misalignments of 200 μm .
- Orbit reconstruction and control for ATF2.



Draft schedule

- Soon :
 - chose the 1 or 2 best algorithms.
 - implementation in the Flight Simulator (if cavity BPMs available).
- Optimisation :
 - Interaction with other feedback (as soon as others are available in FS).
 - Handle errors (e.g. Missing BPMs).
 - Orbit reconstruction and control.
 - Compare expected correction and experimental one.



Draft schedule

what should be done soon

- create a web page to put all algorithms and the results **for the same conditions**
- make a small meeting (informal) to decide which one(s) implement in the Flight Simulator
- decide who will transfer it to the FS, who will make the GUI.

