Tracking simulation plans

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Need for tracking simulation studies

- Simulate the UA9 Experiment in the SPS in order to validate the modeling of crystals and collimators
- Apply the model to the LHC
  - Perform virtual experiments
  - Optimize the layout
- Finally make performance predictions on a crystal based collimation system in the LHC at high energy and intensity
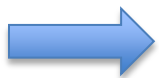
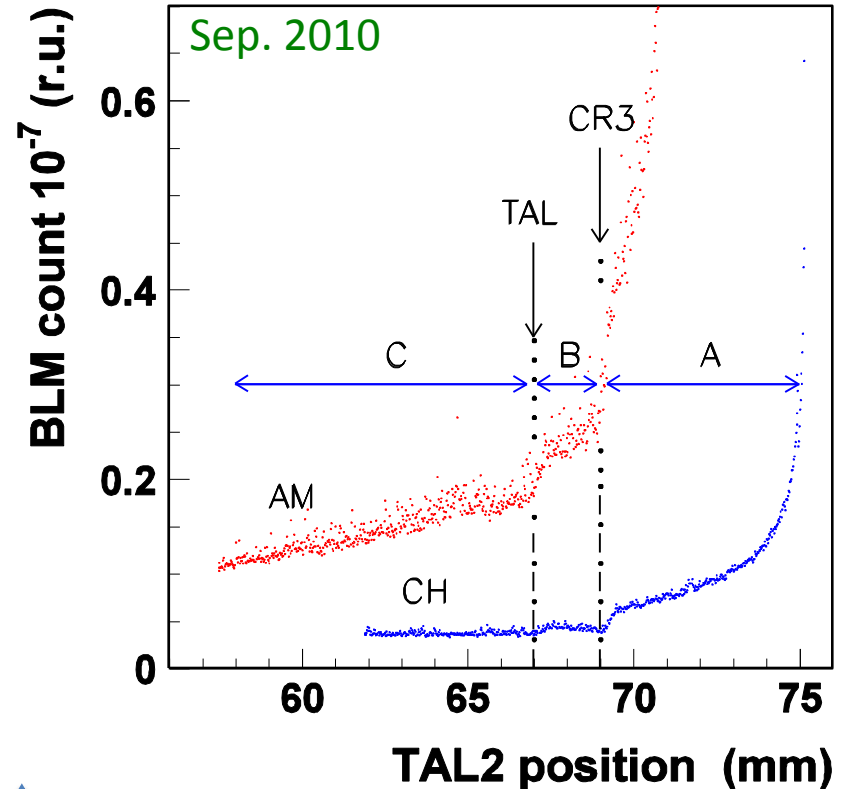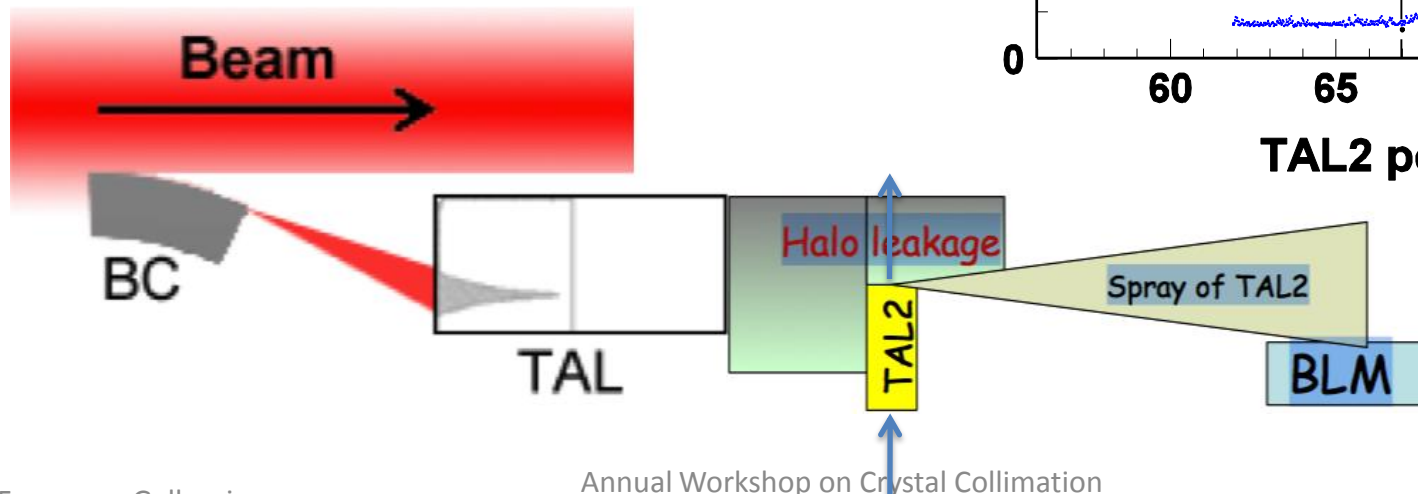*Resume tracking simulation studies*

Medium term plan - SPS
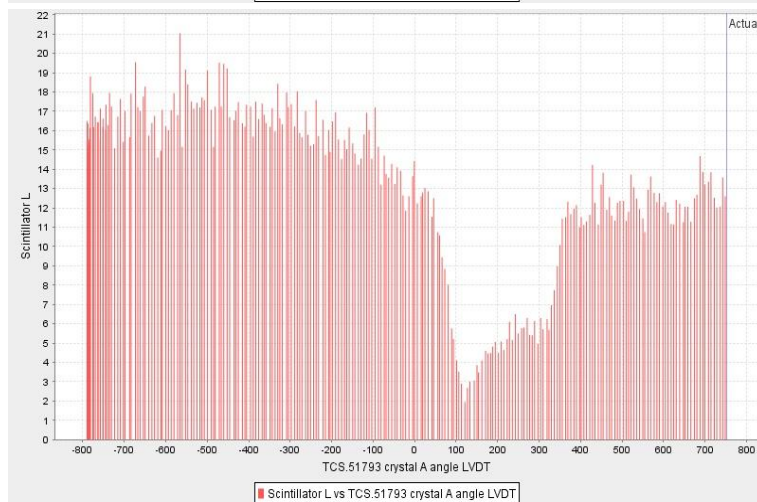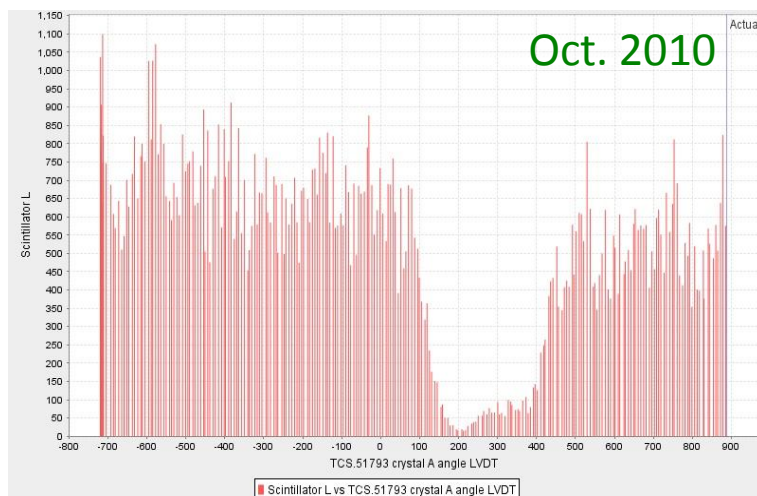
- Simulate the 2010 UA9 Experiment
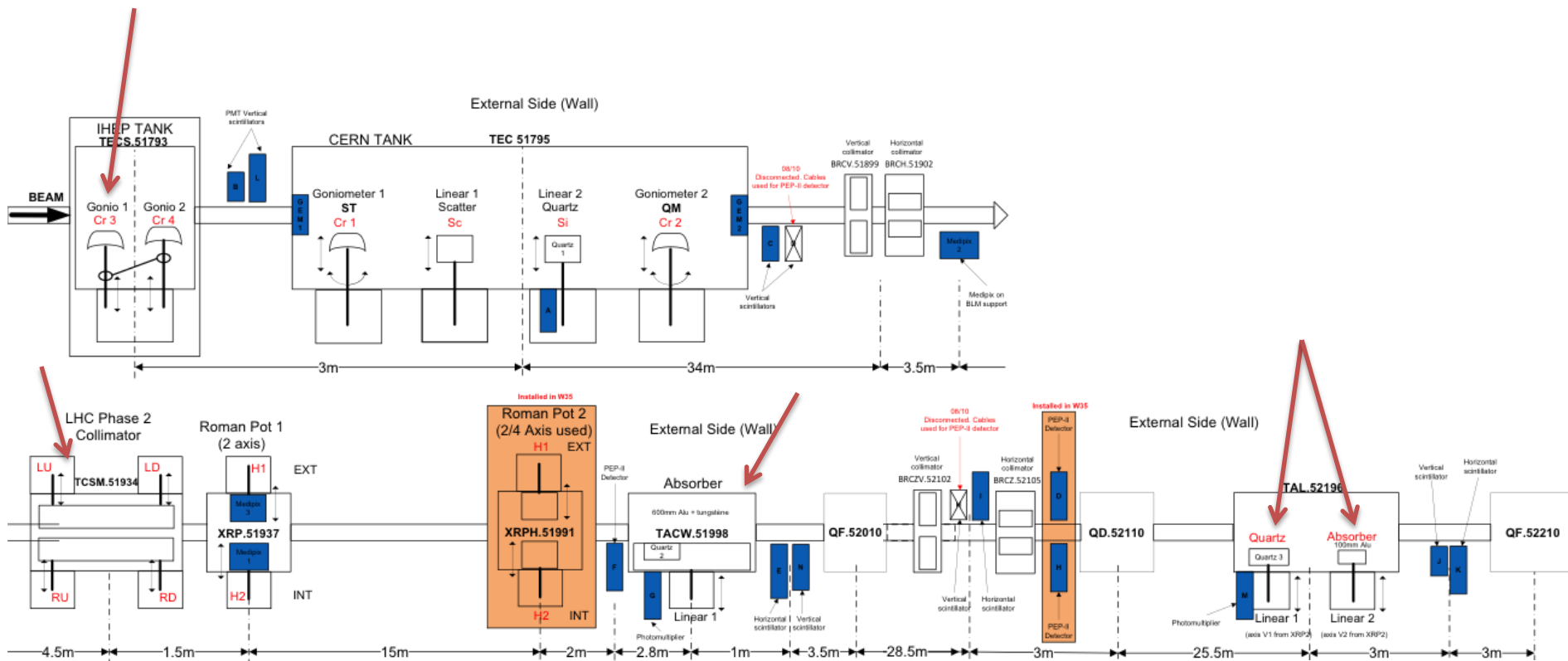
Medium term plan - SPS

• Reproduce the beam loss measurements at different detectors during TAL2 scans

• Obtain a proton loss map around the machine to be compared with BLM readings

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BLM count 10^{-7} (r.u.)

CR3

TAL

C   B   A

AM

CH

0.6

0.4

0.2

0

60   65   70   75

TAL2 position (mm)

Beam

BC

TAL

Halo leakage

TAL2

Spray of TAL2

BLM

"Somehow shorter" term plan

Oct. 2010

• Reproduce the angular scan of Crystal 3 at different amplitudes in order to understand the dependence of $Loss_{CH}/Loss_{AM}$ and of the channeling angle on crystal position.

Crystal at 4.5 σ
◆ Nuclear loss ratio × 35
◆ Channeling at 100 µrad

Crystal at 6 σ
◆ Nuclear loss ratio × 8
◆ Channeling at 60 µrad

Long term plan - LHC

- Once the model is validated, we can apply it to the elements of the crystal collimation scheme proposed for the LHC, and compare the performances with those of other maybe more conservative collimation schemes.

Summary

- Quite an ambitious program

- Some people have offered their part-time collaboration to help resume tools already available

- Hopefully could get some other help, maybe also to introduce some more sophisticated crystal routine