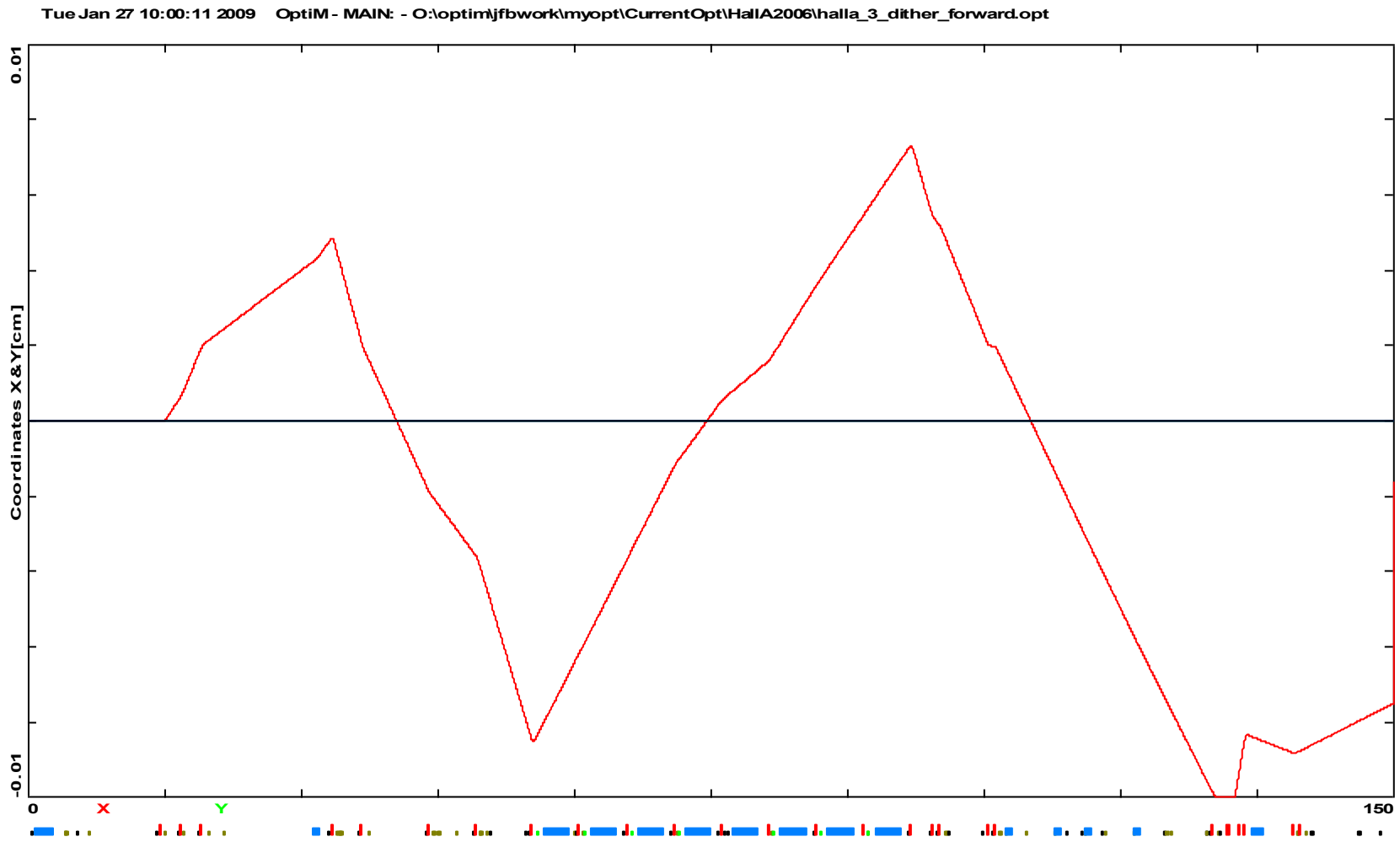
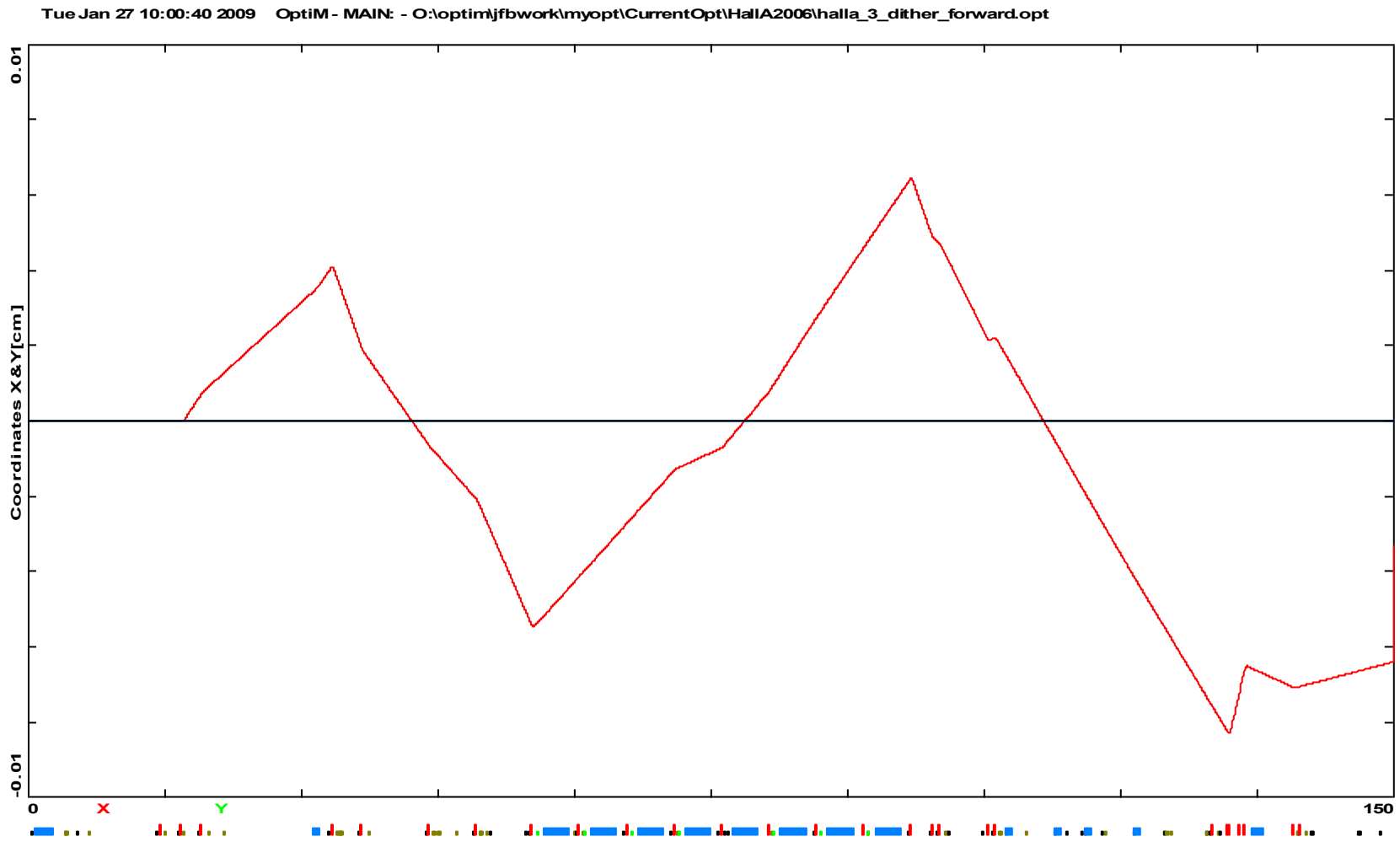
Parity preparation for Hall A

- Riad Suleiman is in overall charge of "parity quality beam" for Accelerator Division.
- Jay Benesch is Qweak coordinator and jack-of-all-trades for beam line alteration for Accelerator Operations.
- A question by Dave Mack led to a new method for locating calibration/dithering coils for parity experiments
- Kent Paschke and others have discussed moving to sine wave excitation of the calibration coils at frequencies to 270 Hz.
- Spring down begins mid-March. Summer down is likely to be shortened to four weeks. Design for anything which must be installed in the BSY must be completed ASAP.

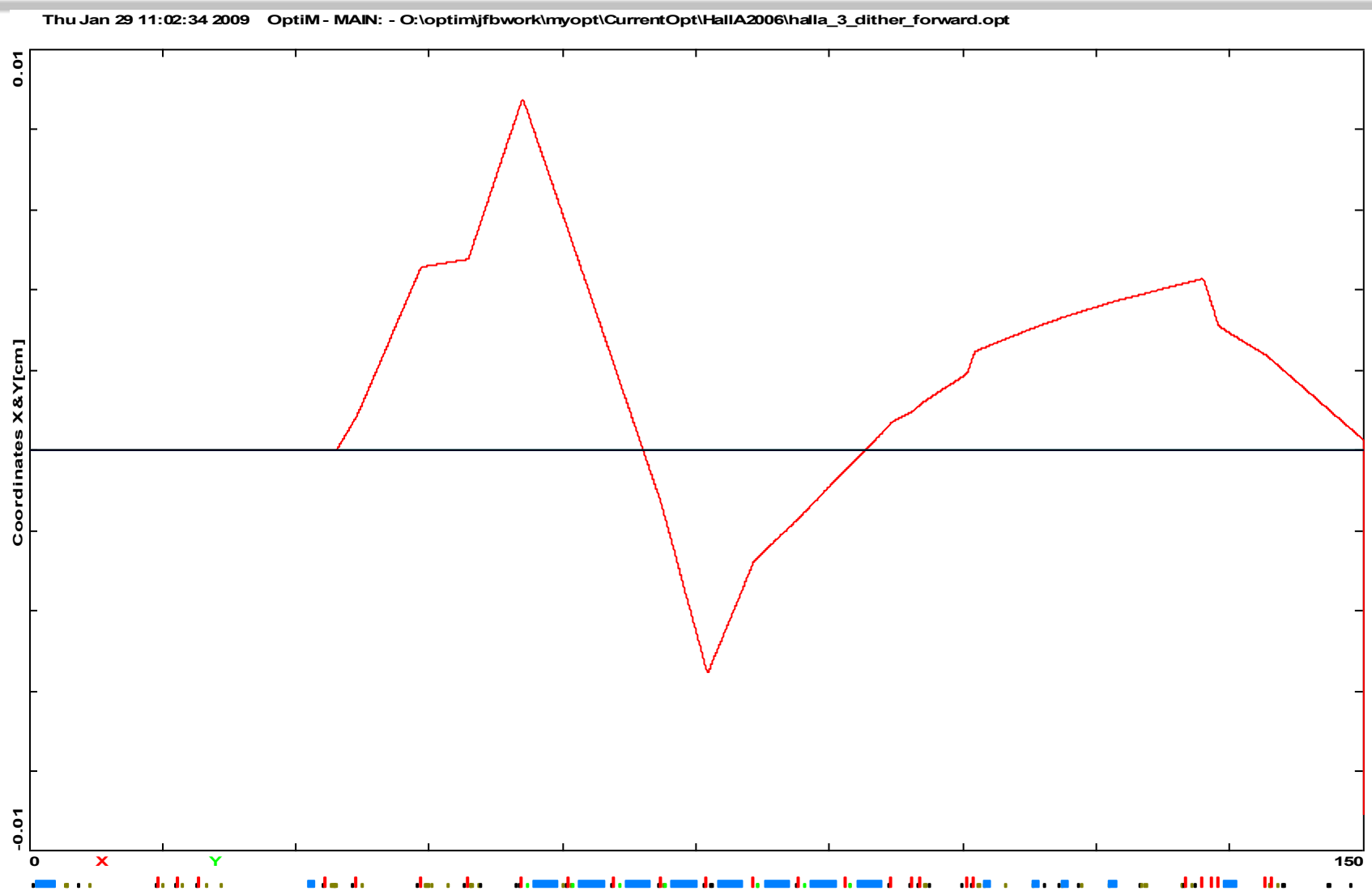
existing H location 1



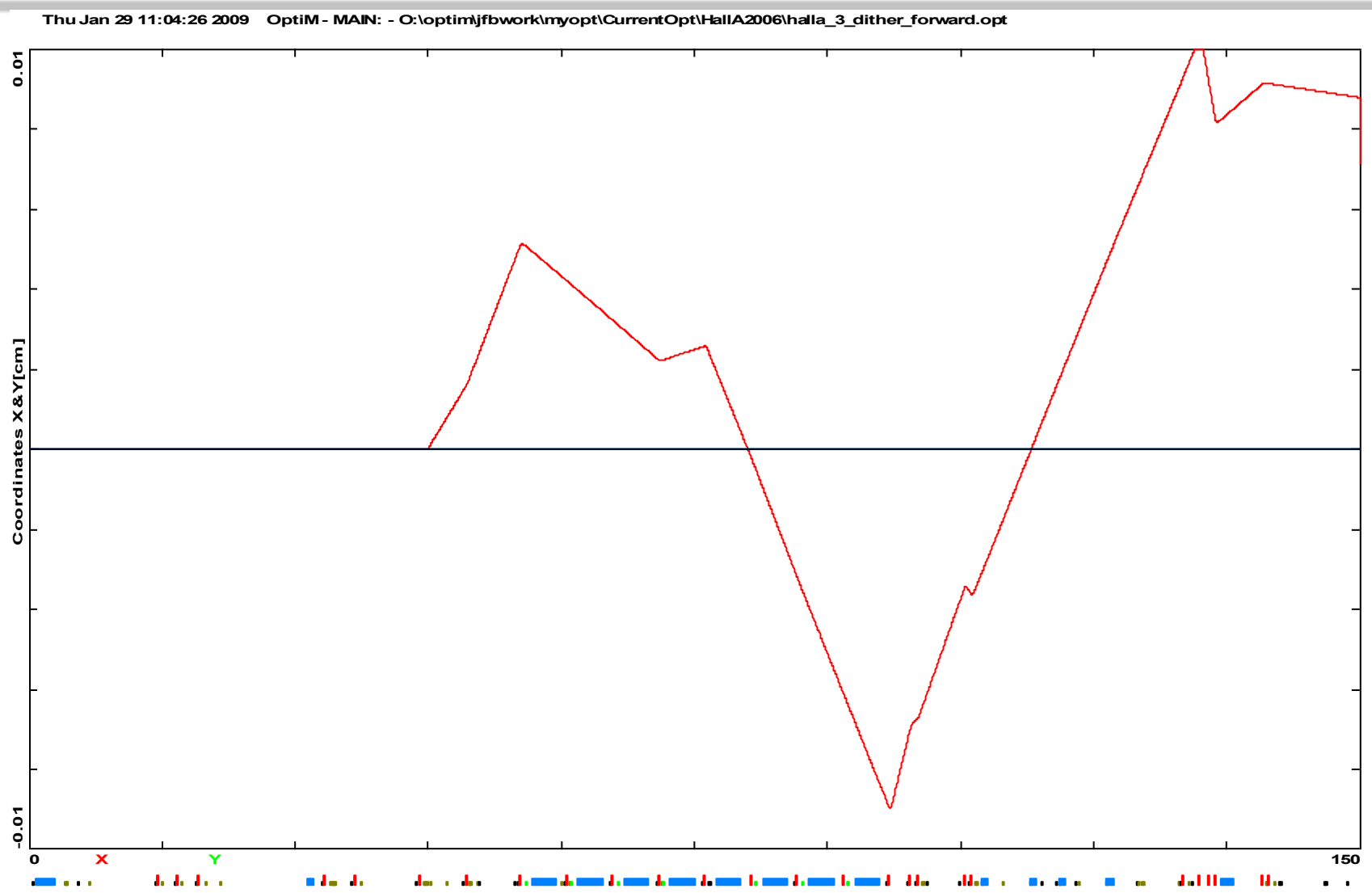
existing H location 2



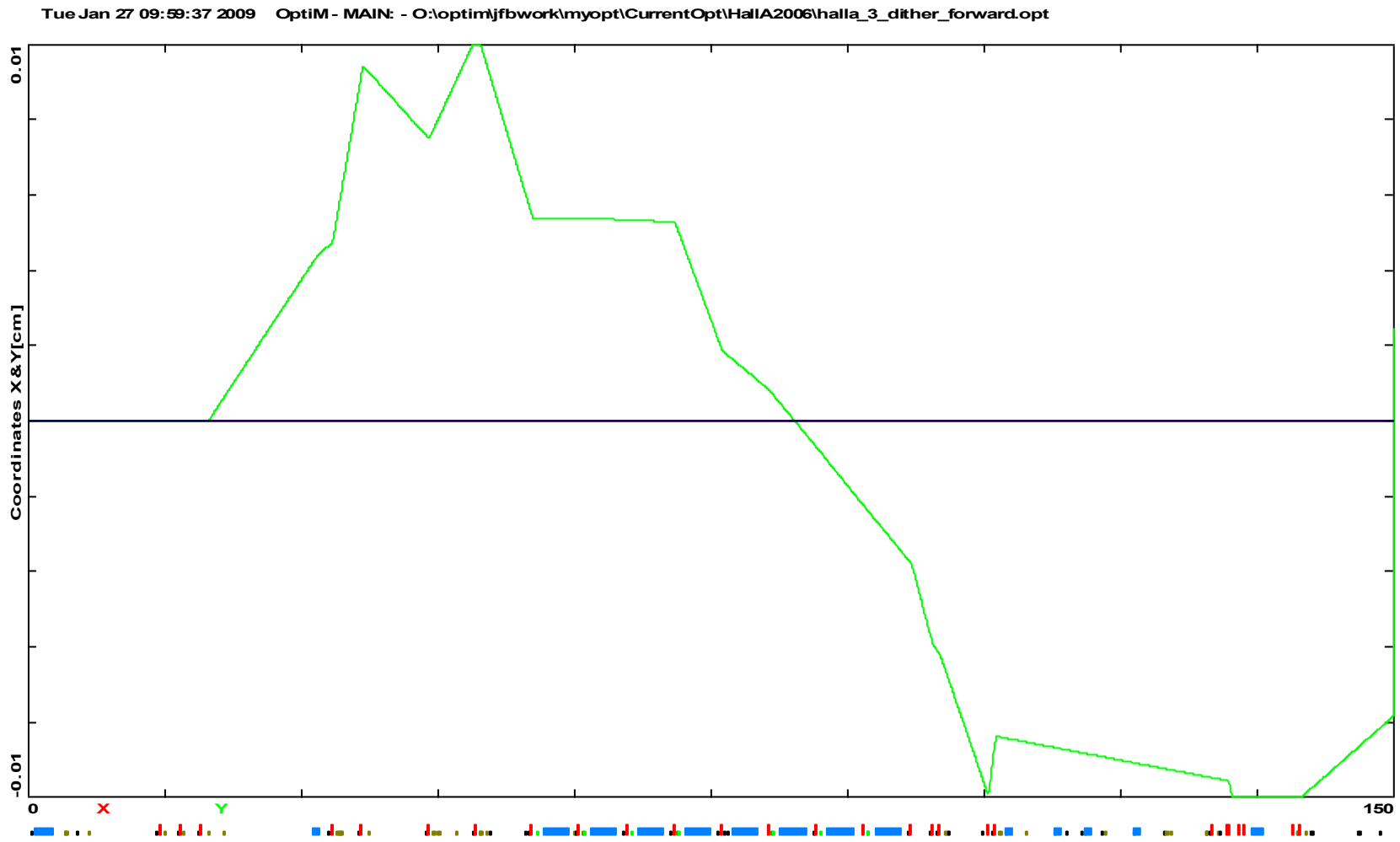
existing H location 3



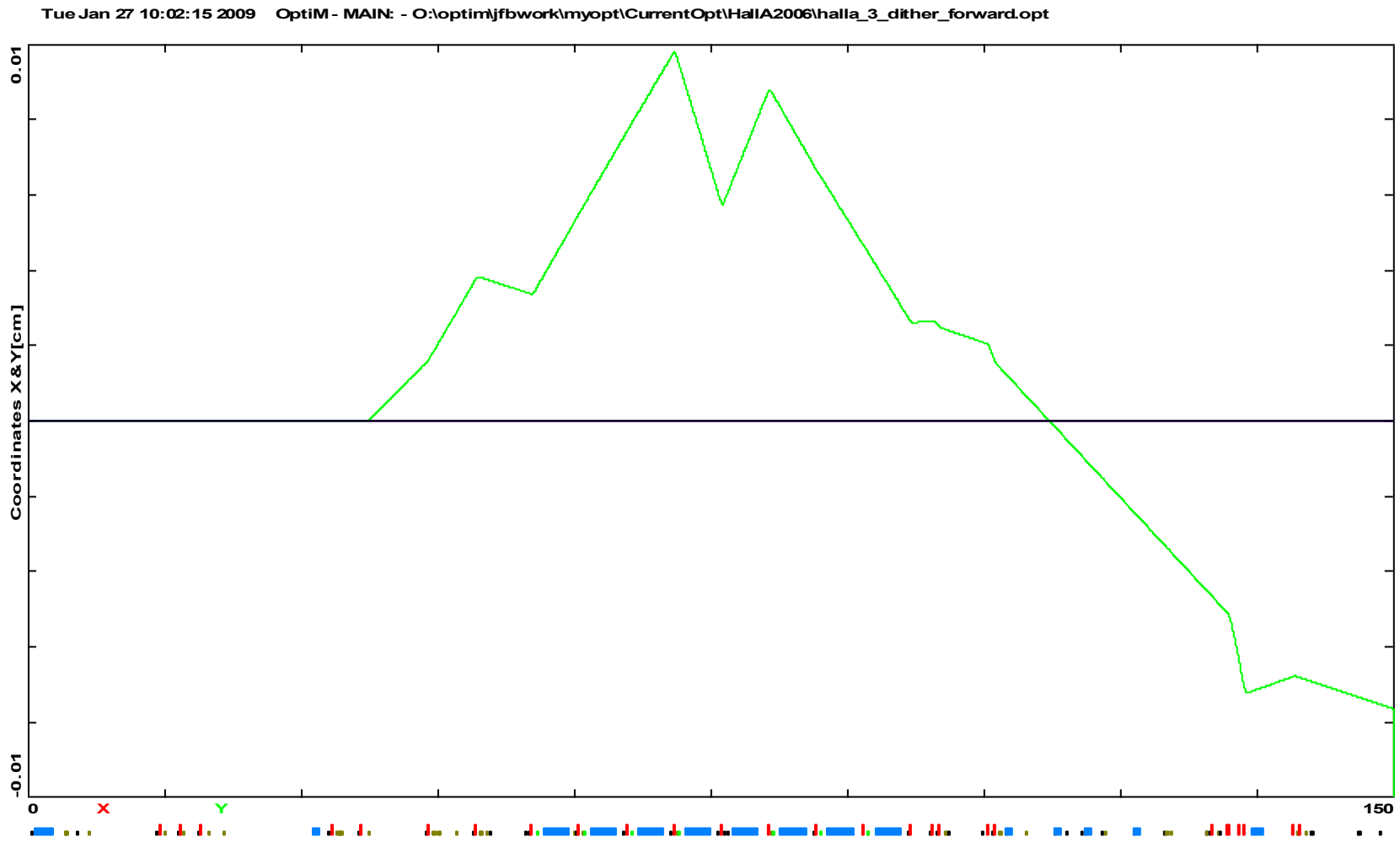
existing H location 4



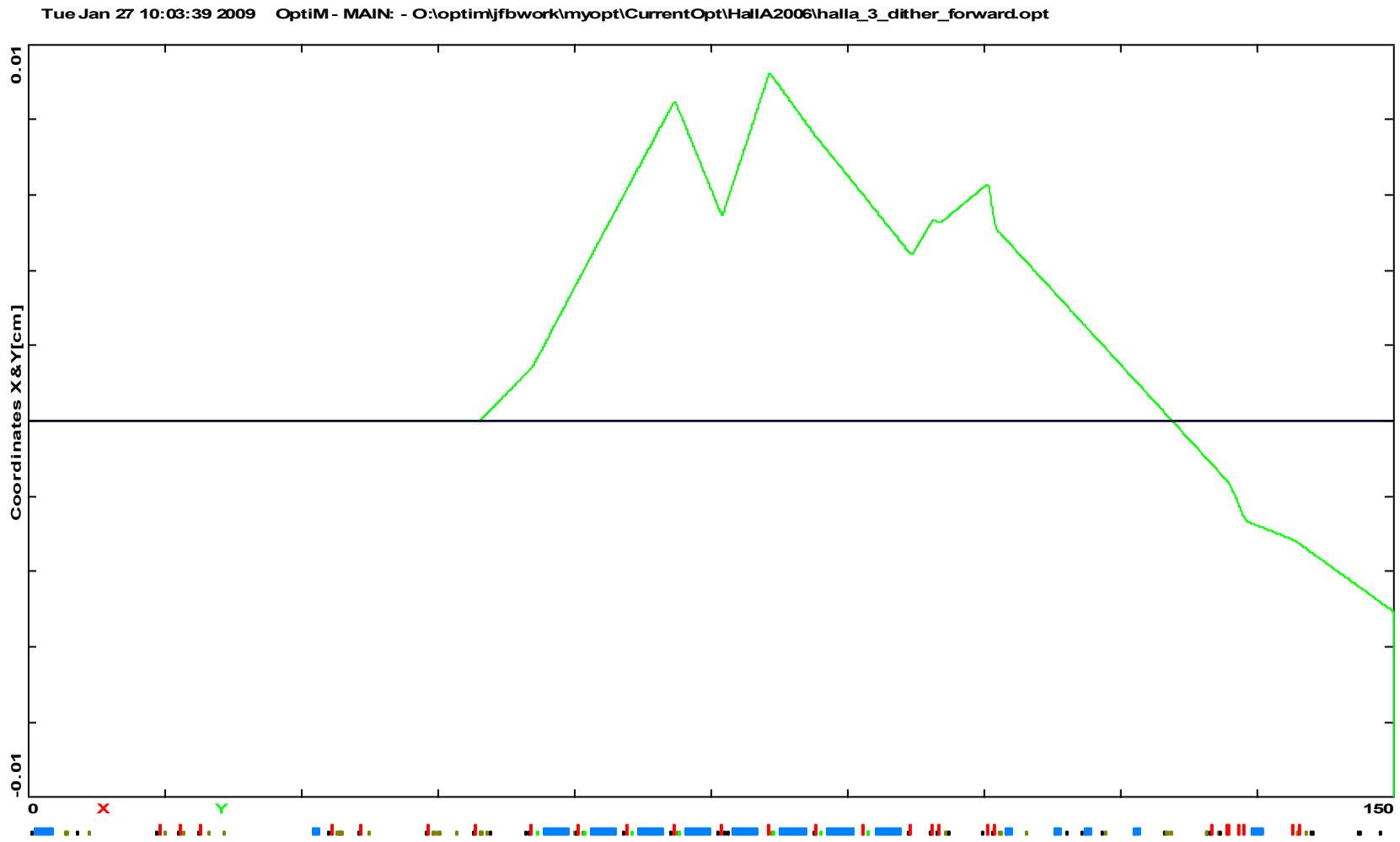
existing V location 1



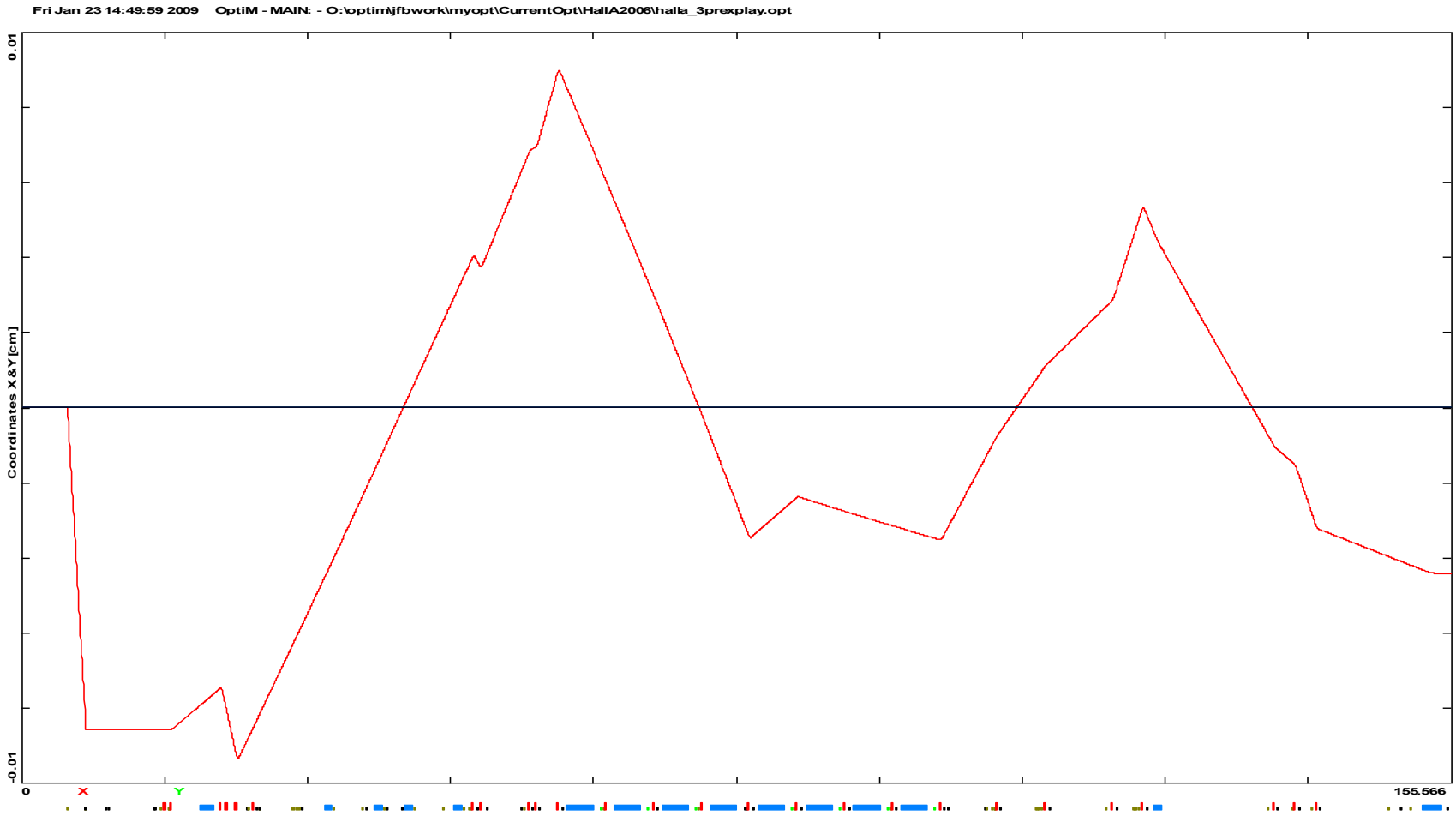
existing V location 2, 20 G-cm



existing V location 3, 20 G-cm

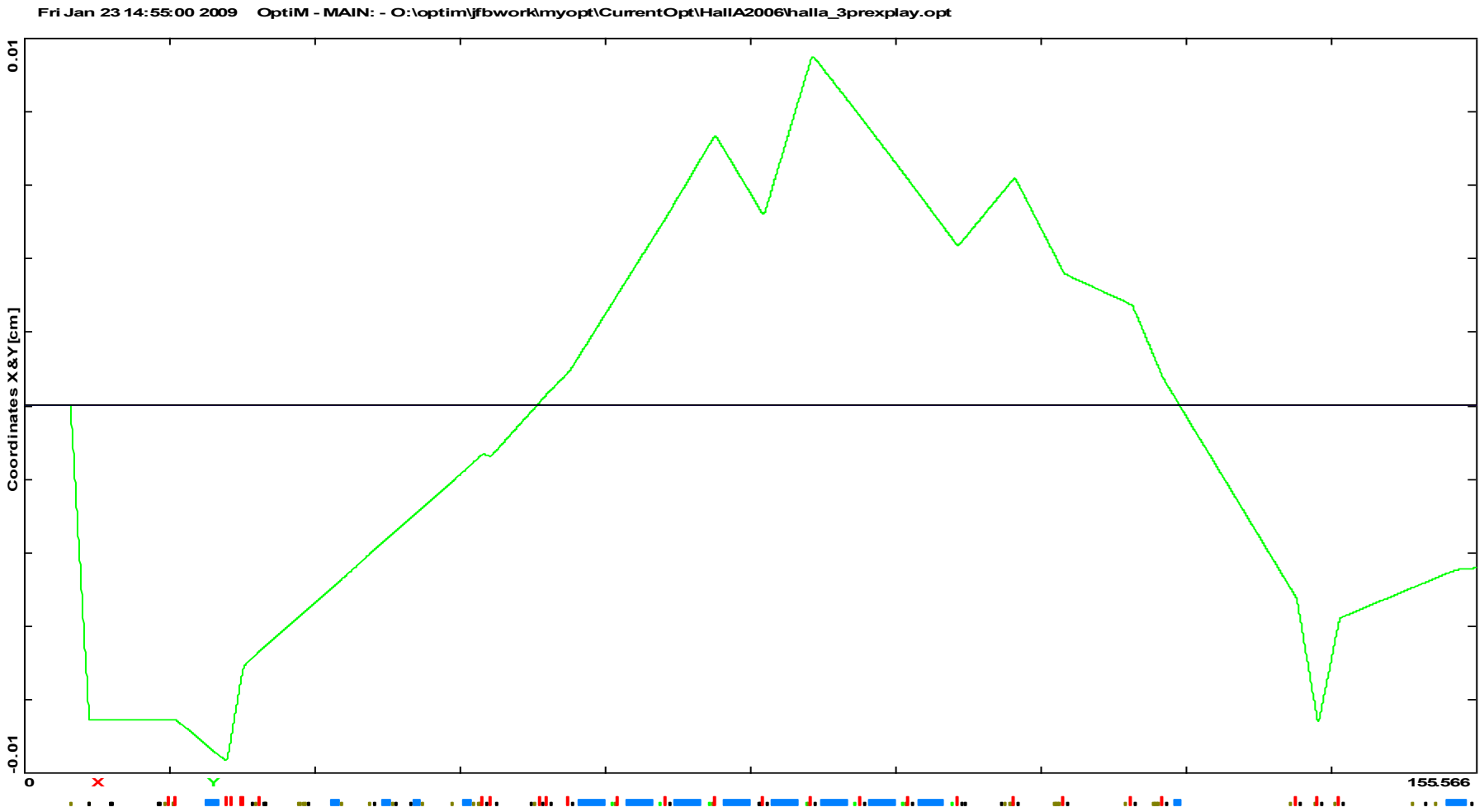


horizontal displacement at target



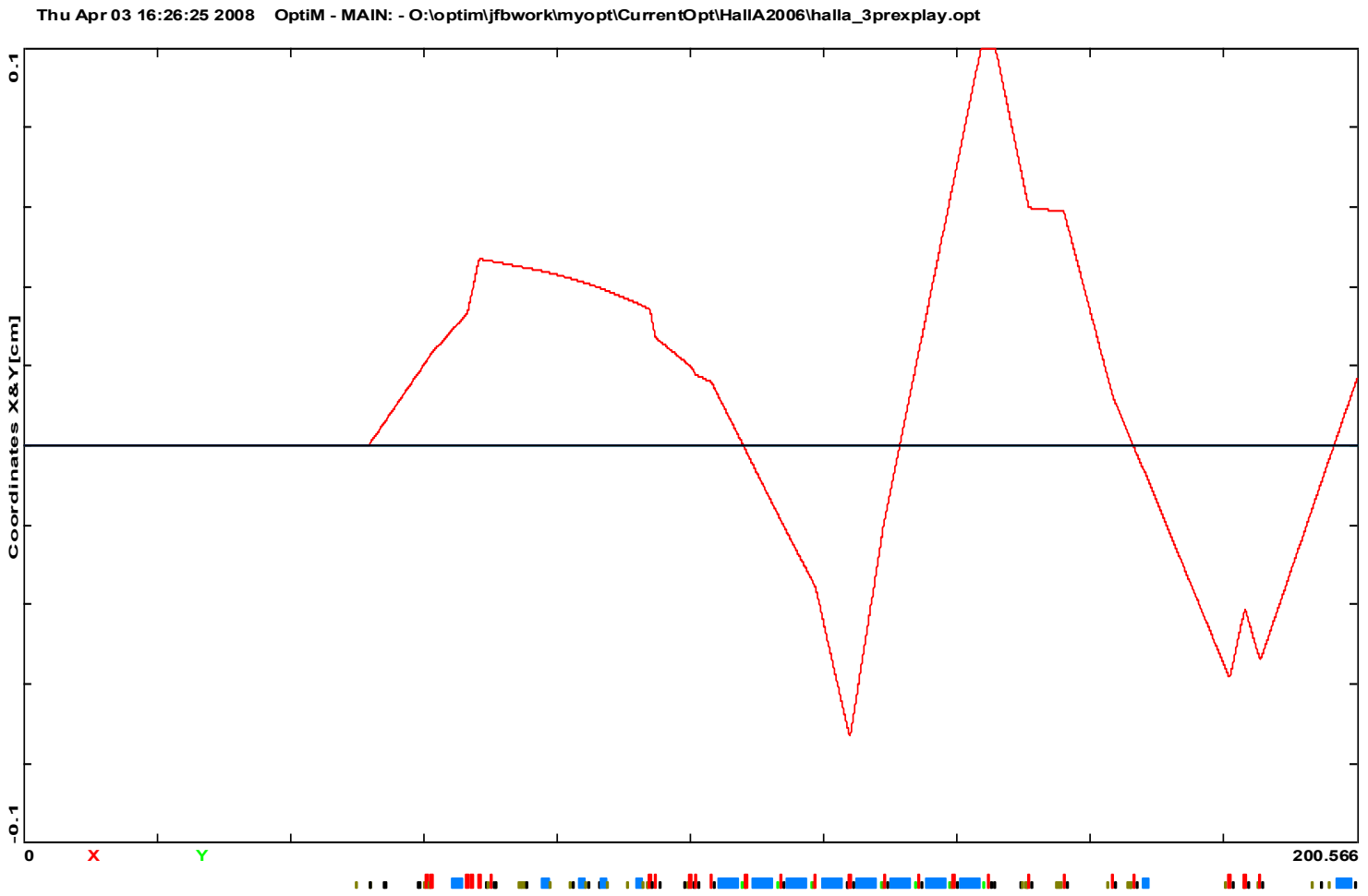
Line inverted so a displacement at the target, in this case horizontal, is back-propagated so one can locate, via the zero-crossings, where a single corrector in the real line produces a pure displacement

vertical displacement

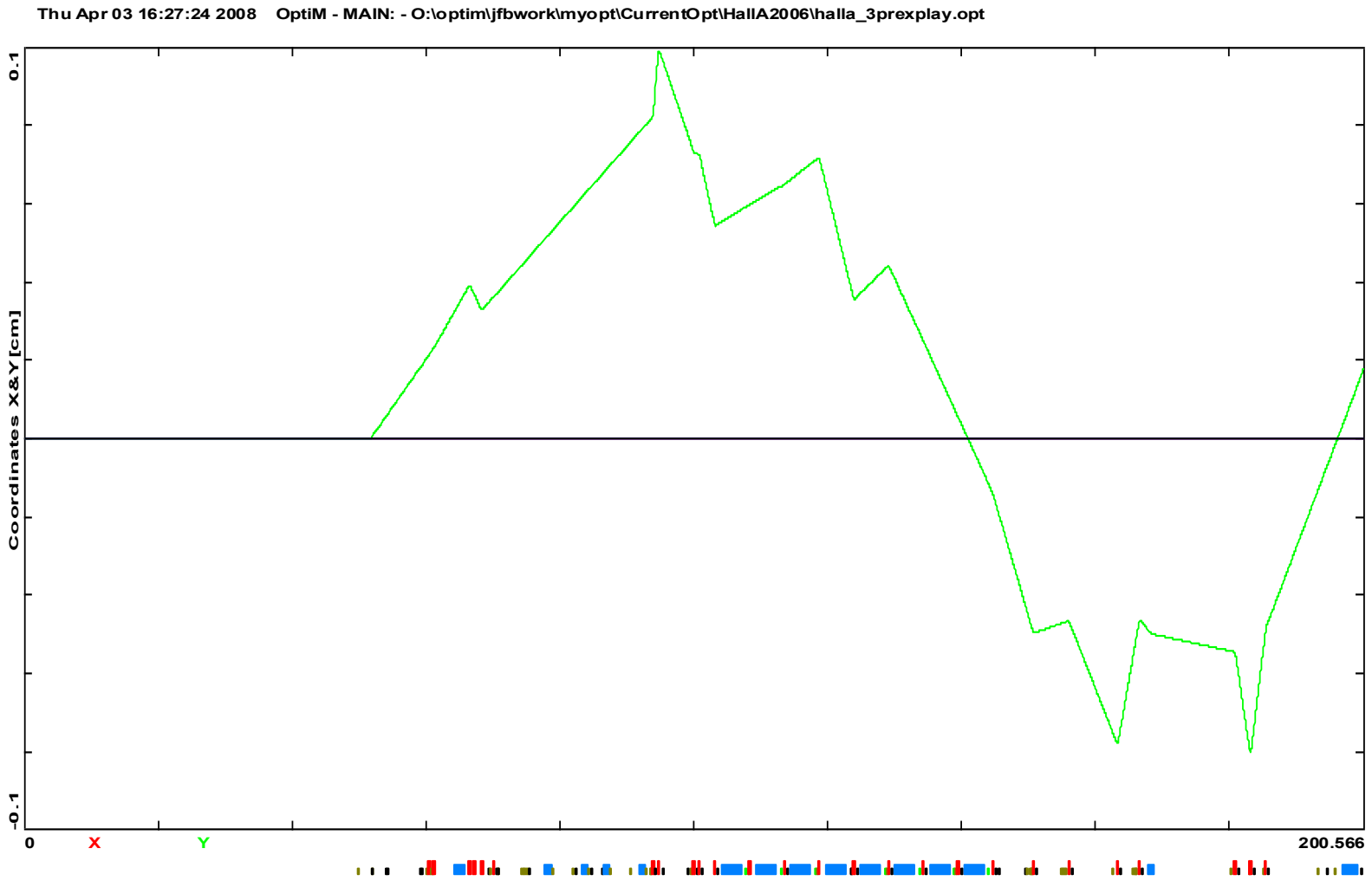


only one zero-crossing available for vertical displacement before the arc and it's inside the BN magnet, so corrector will be offset

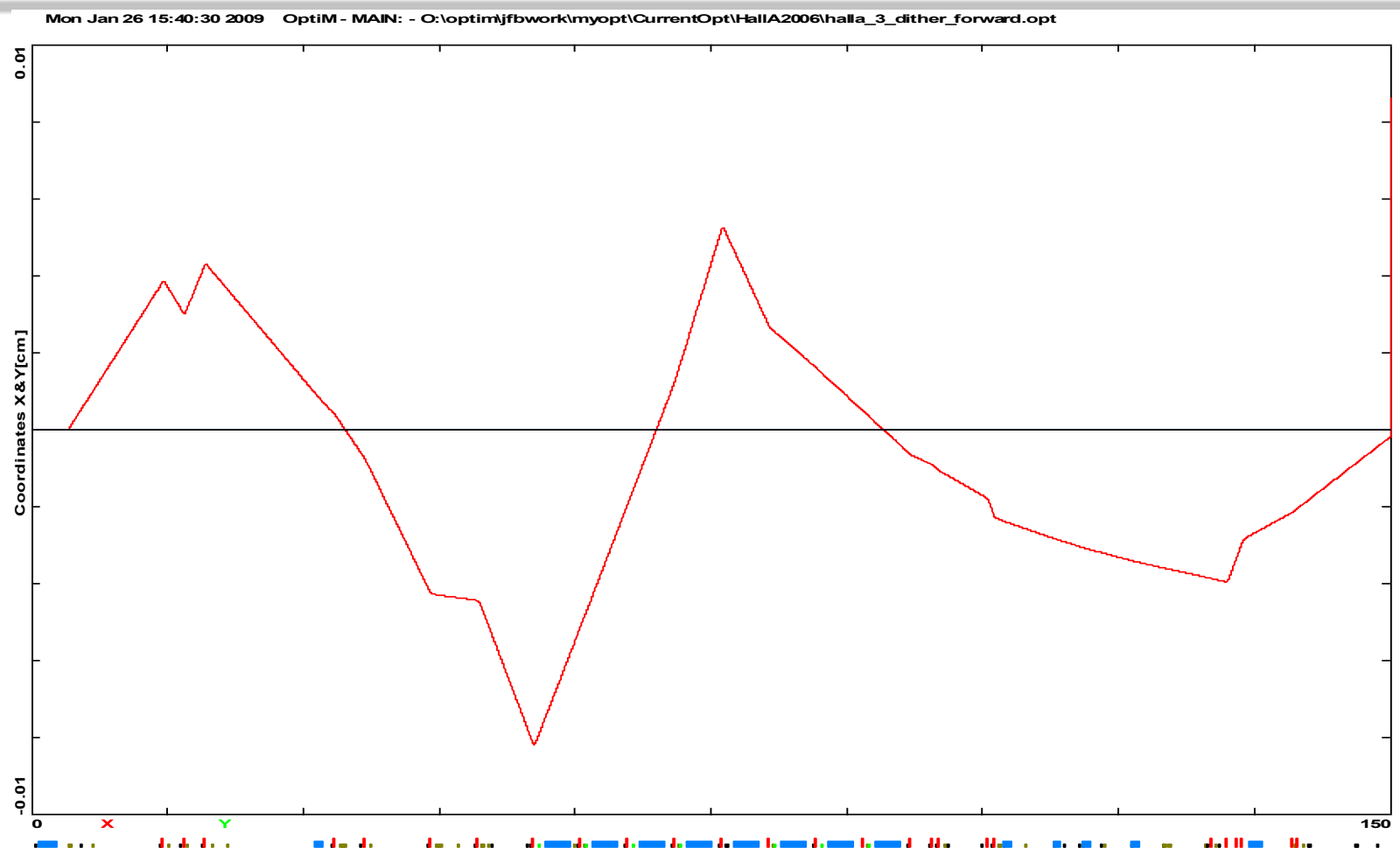
pure angles


Thu Apr 03 16:26:25 2008 OptiM - MAIN: - O:\optim\jfbwork\myopt\CurrentOpt\HallA2006\halla_3prexplay.opt
0.1
Coordinates X&Y [cm]
-0.1
0
X
Y
200.566

pure angles 2

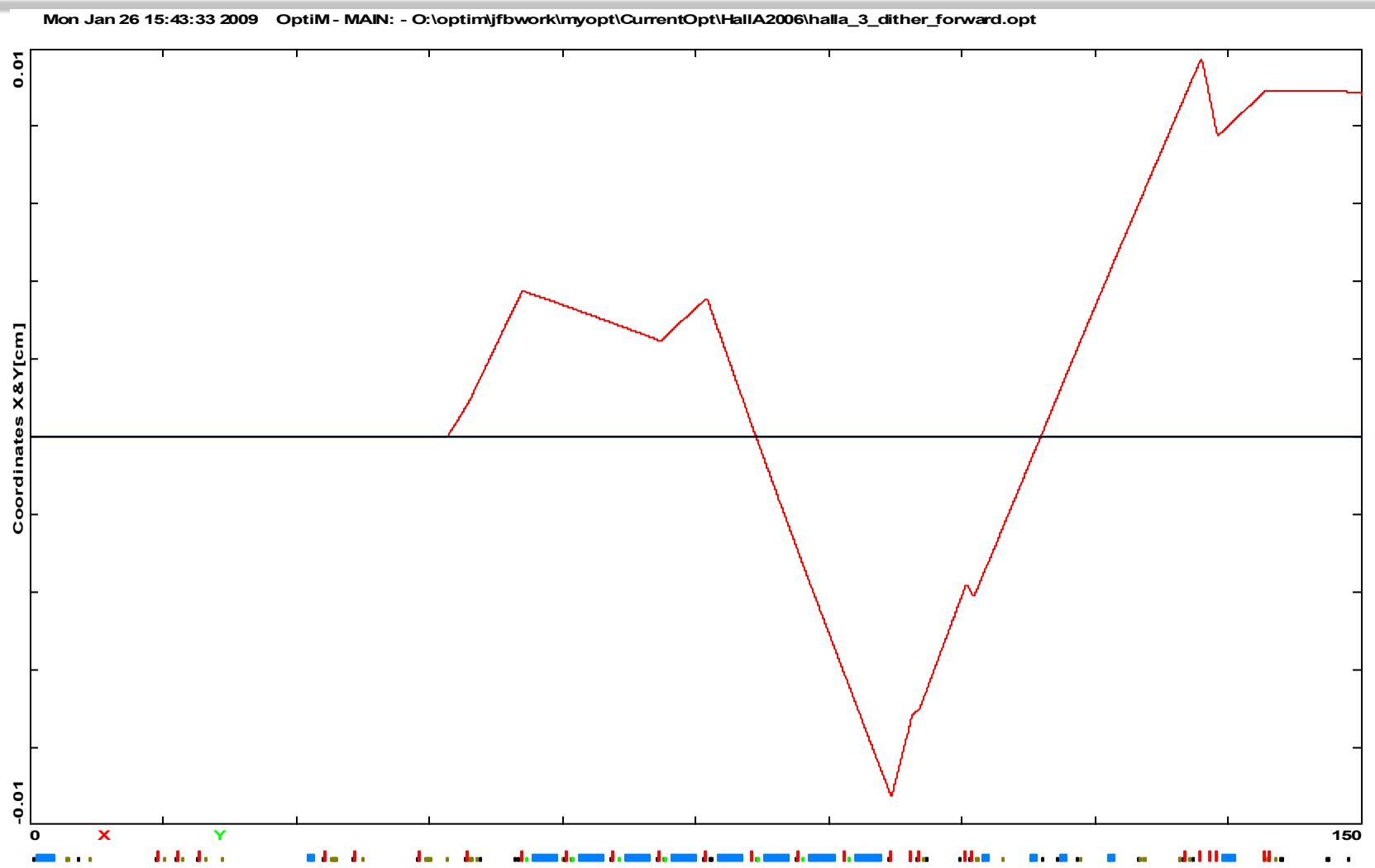


real horizontal corrector 1



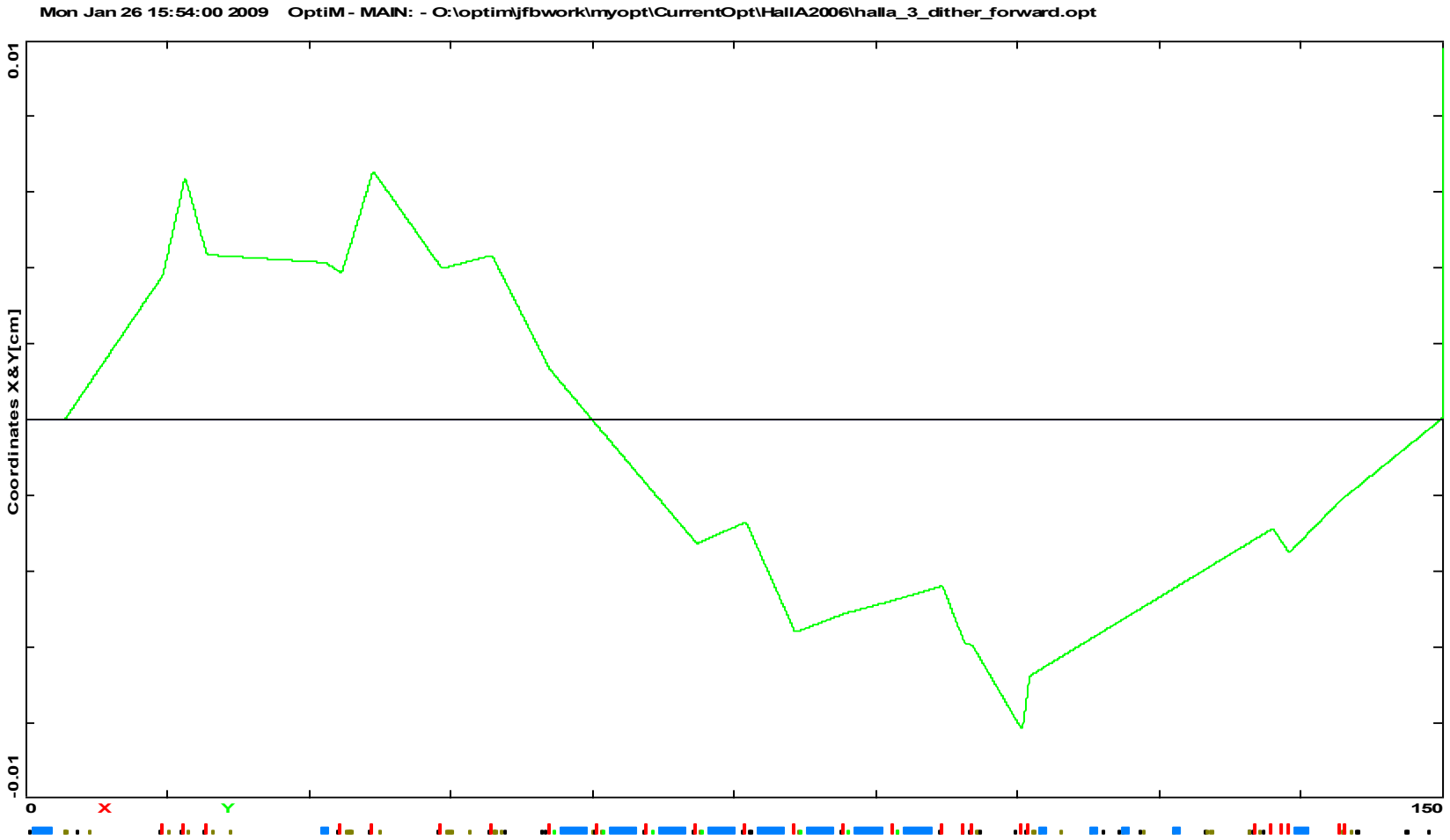
Corrector 1m after Lambertson. Closer would be desirable, but vacuum vessel precludes. Target is just before the right vertical axis. Angle plus small displacement. 30 G-cm

real horizontal corrector 2



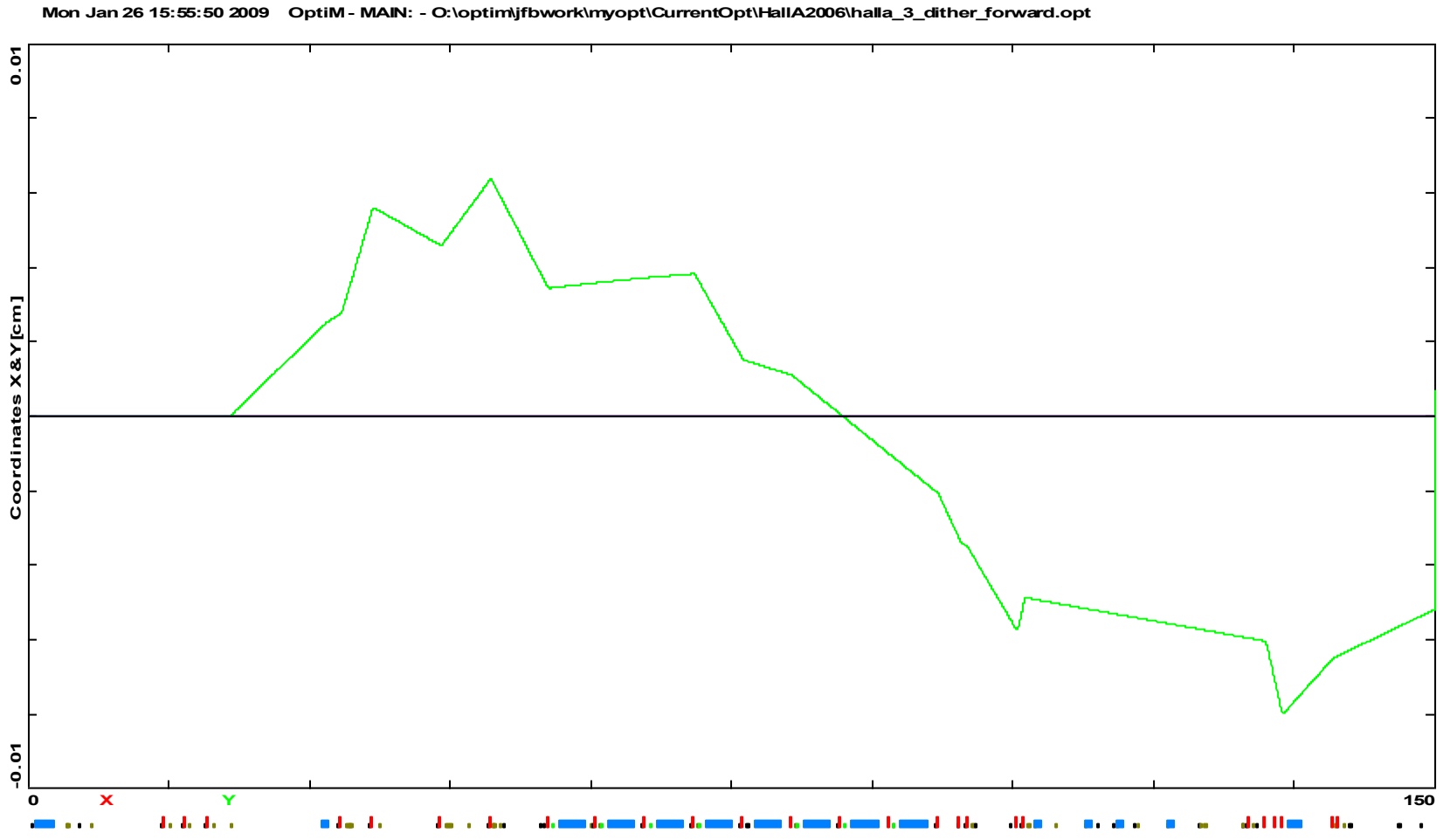
close to a pure displacement 30 G-cm

real vertical corrector 1



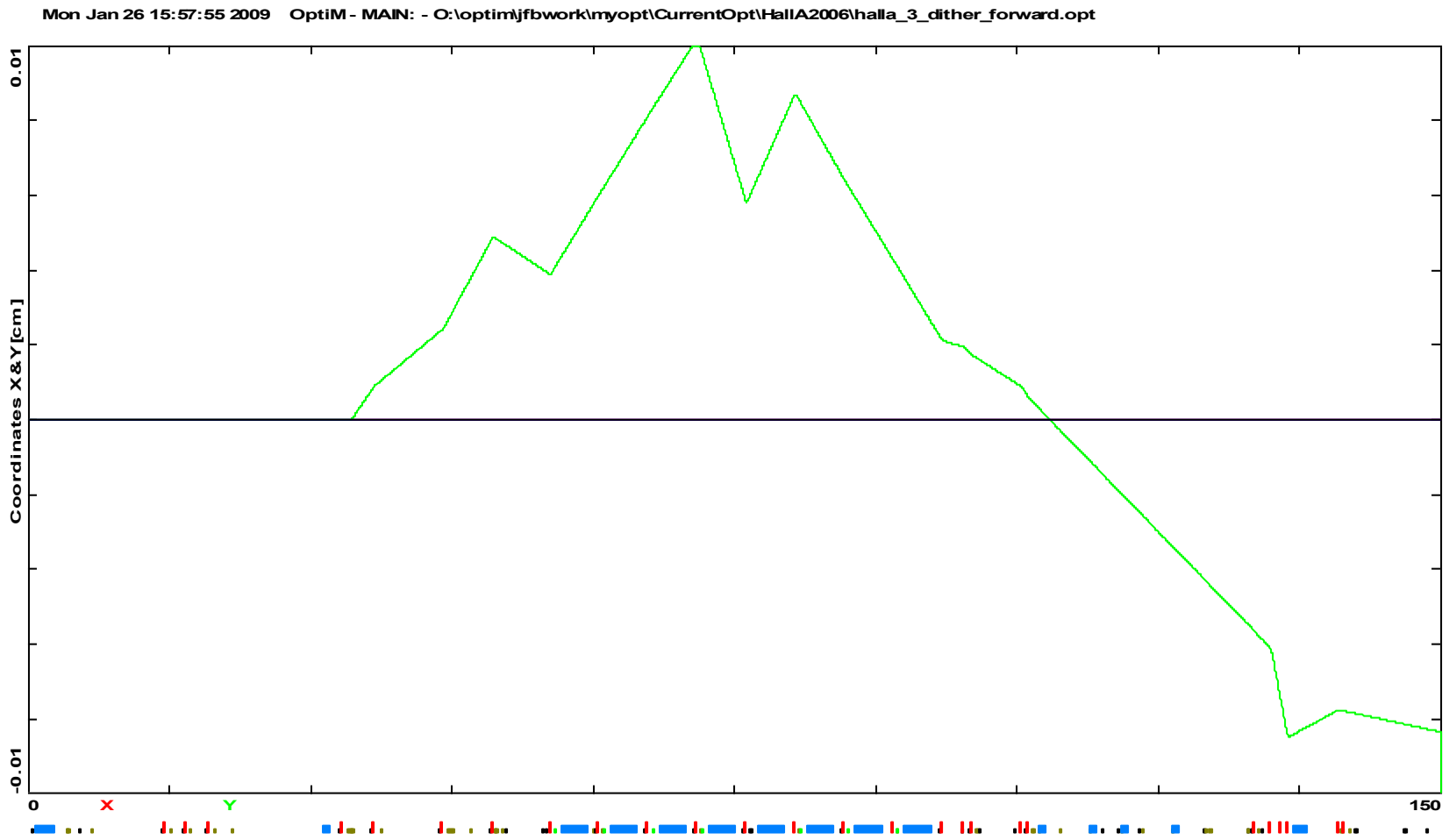
pure angle at target 30 G-cm

real vertical corrector 2



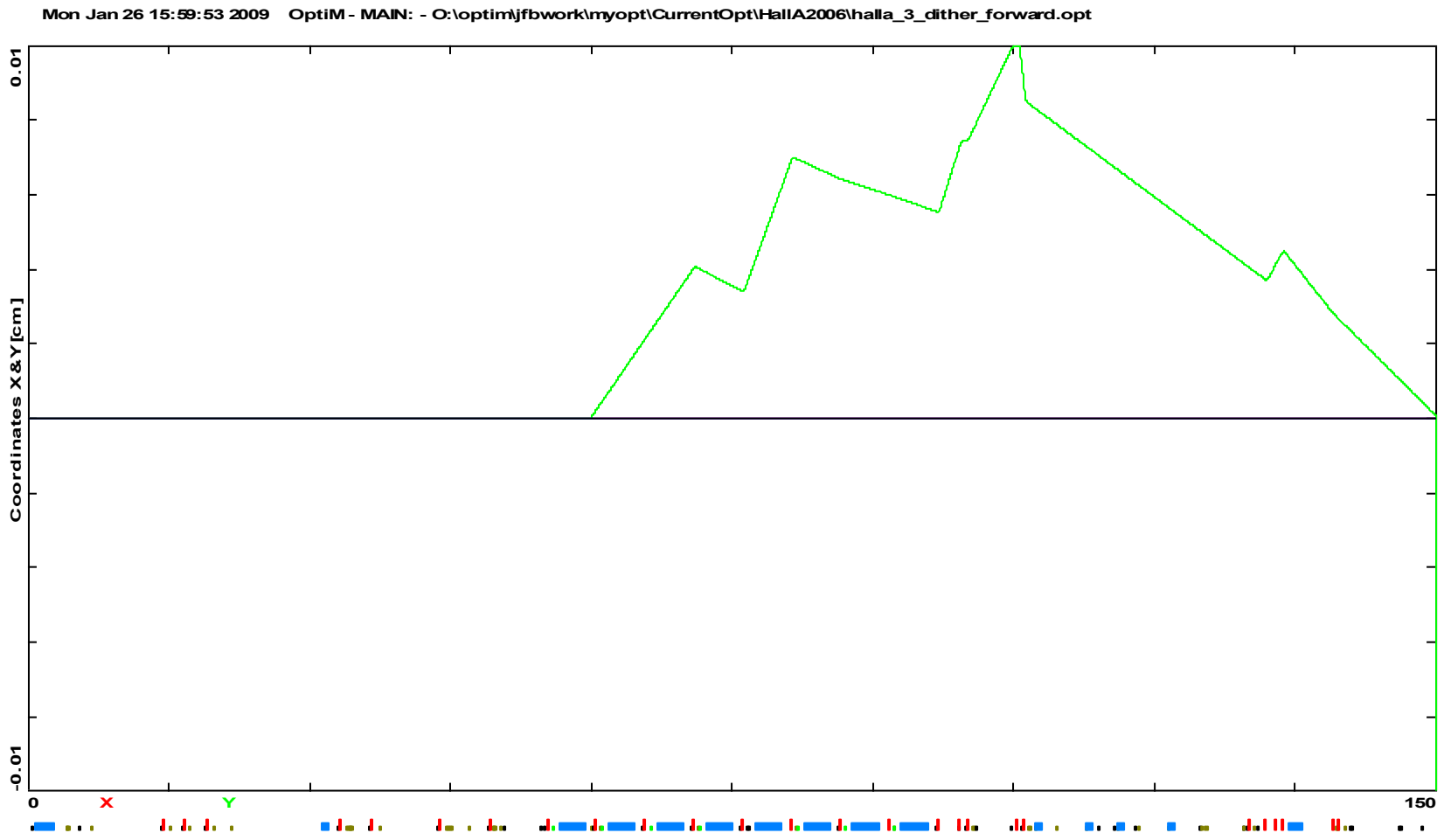
Vertical corrector 2. Mostly displacement but some angle. 2/3 the BdL previously, 20 G-cm

real vertical corrector 3



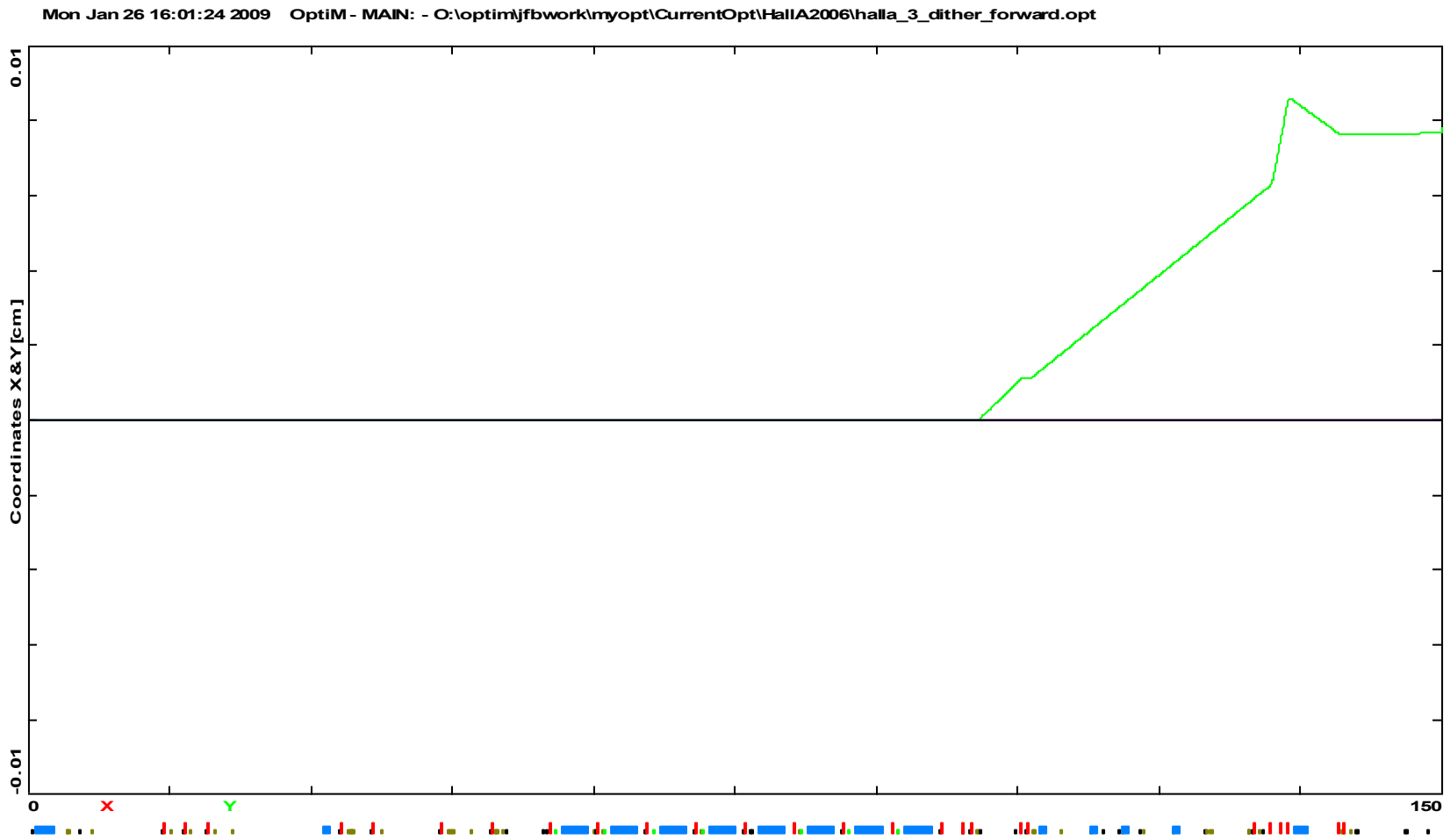
Another option for vertical displacement. Same kick as first three plots, 30 G-cm

real vertical corrector 4



Another option for pure vertical angle at the target. 30 G-cm

real vertical corrector 5



Another option for displacement at the target. Coil is after the arc. 20 G-cm kick. Kick after 1C12 BPM so energy-position matrix element unavailable. Vertical – does it matter?

Caveat

The beam transport team is working on a new paradigm for beam property measurement and matching. Diagnostic girders will be placed before the hall dumplets. Matching will take place in the transport lines so the quads in the hall line which have in the past been used for matching will not be changed from design values. Whether this will suffice for multiple fifth pass beams is not known. The plots shown assume that the hall quads which have been used for matching, 1C 4-8, 16-20, and 1H01-4, will remain at design values.

I personally will not match the beam in the hall A line unless I am given permission to mask the ep ion chamber for as long as the matching takes – and not in five minute intervals.

Actions needed

- Location choices by Hall A, i.e., which vertical?
- Approval by Hall A collaboration to relocate/place these coils during the March down.
- Beam tests of FFB system interaction with calibration coils similar to those run by Paschke and Spata last year should be run before the March down covering 30-270 Hz.
- Designation of collaborators to decide on coil drive hardware and frequency.
- Designation of collaborators to work with Jay Benesch or Scott Higgins to write a software requirements document for the Operations Control Group
- DAC rate change for sinusoidal dithering