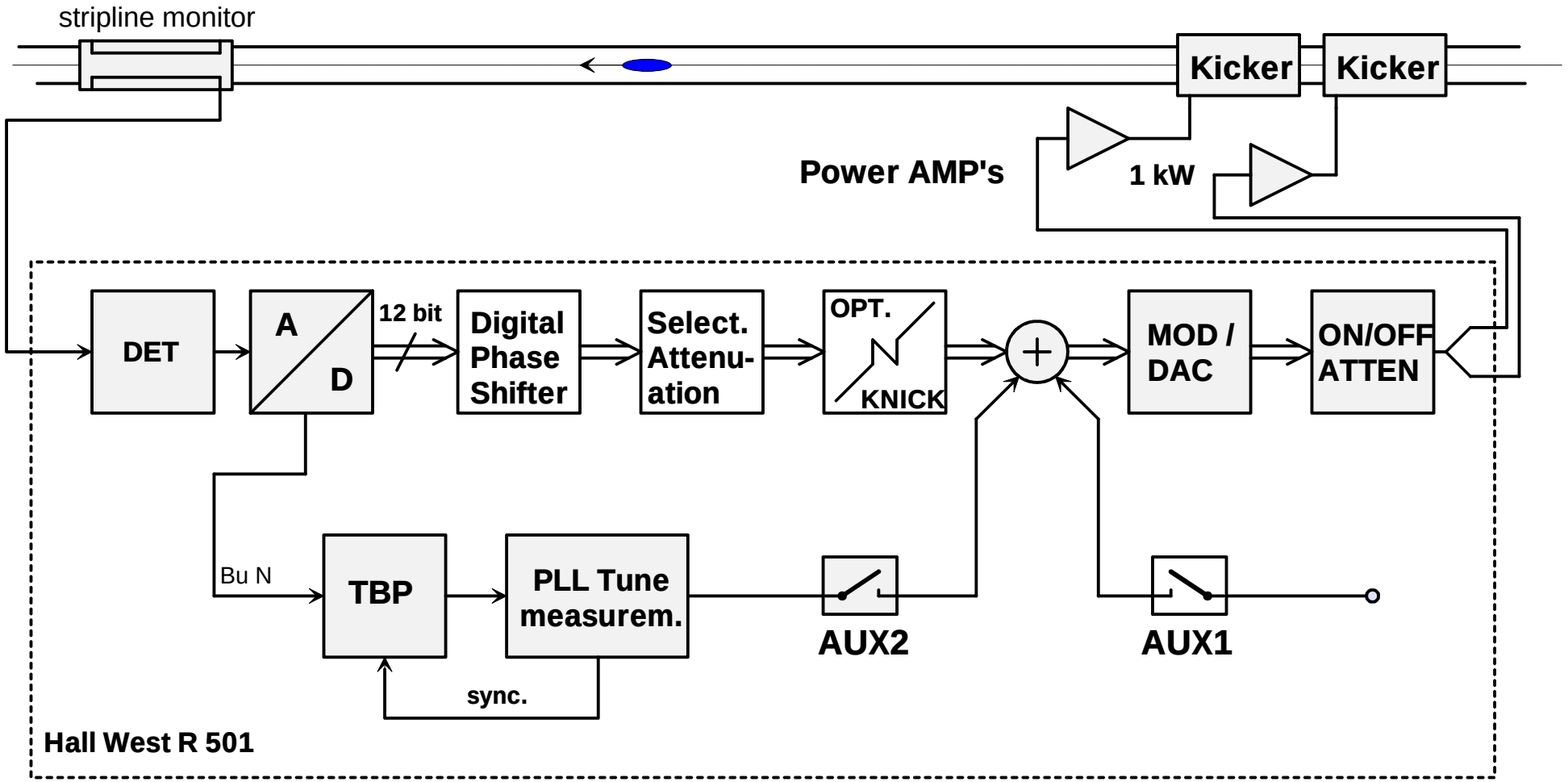
HERA Proton Transverse Multibunch Feedback with Tune Indicator



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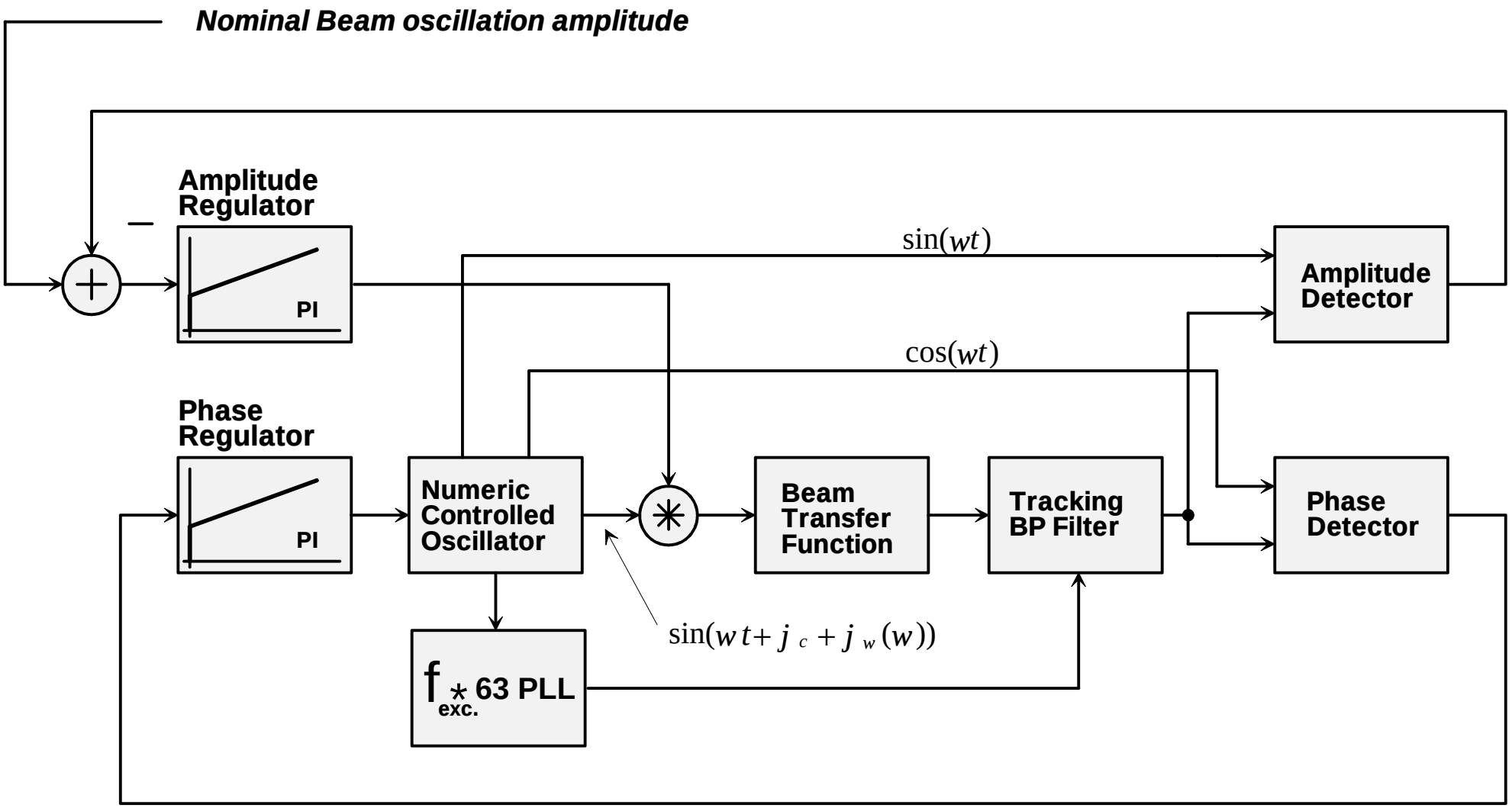
HERA Proton Tune Indicator



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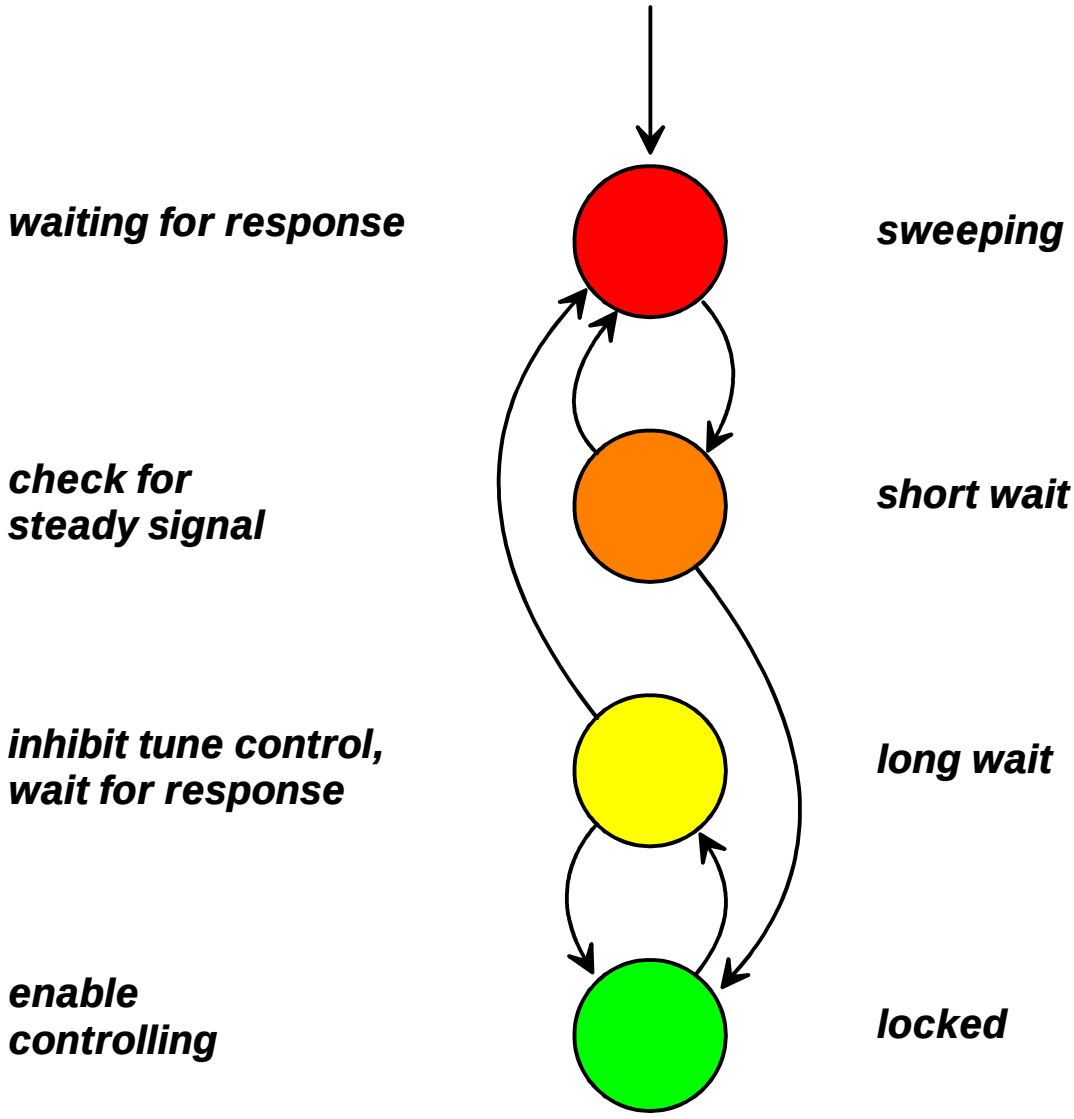
The Tune Indicator State Machine



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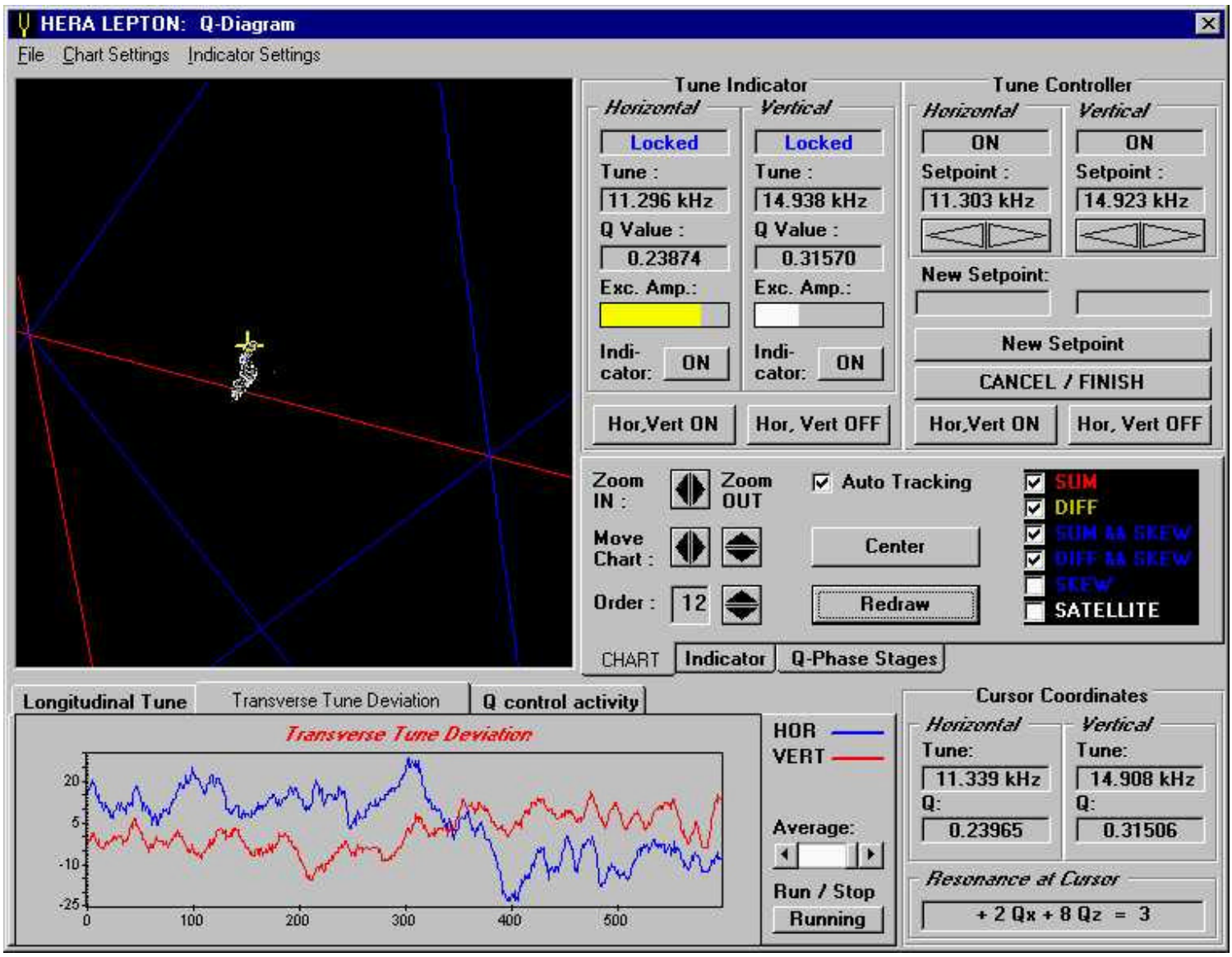
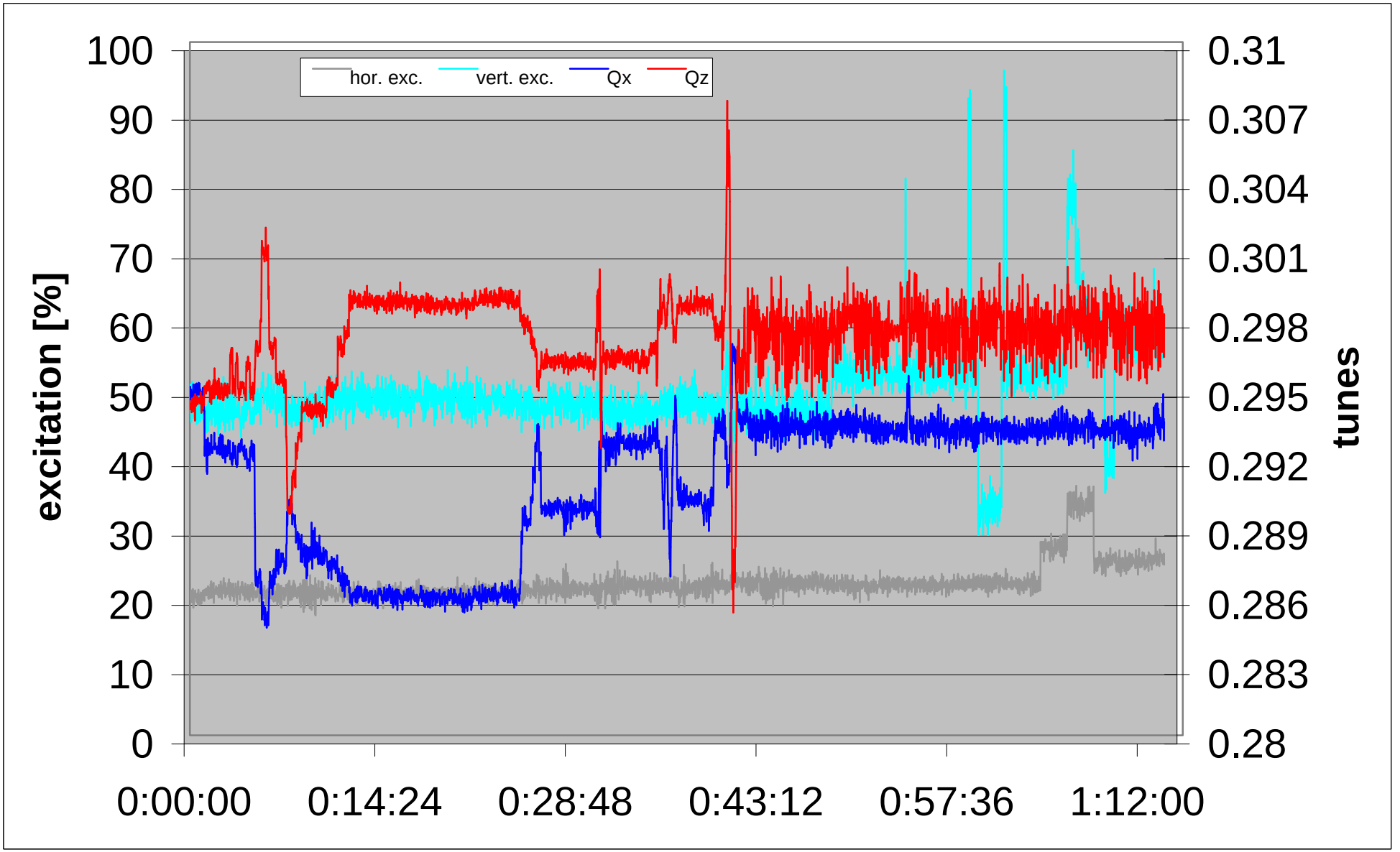

HERA LEPTON: Q-Diagram
File
Chart Settings
Indicator Settings
Tune Indicator
Horizontal
Vertical
Locked
Locked
Tune :
11.296 kHz
Tune :
14.938 kHz
Q Value :
0.23874
Q Value :
0.31570
Exc. Amp.:
Exc. Amp.:
Indi-cator:
ON
Indi-cator:
ON
Hor,Vert ON
Hor, Vert OFF
Tune Controller
Horizontal
Vertical
ON
ON
Setpoint :
11.303 kHz
Setpoint :
14.923 kHz
New Setpoint:
New Setpoint
CANCEL / FINISH
Hor,Vert ON
Hor, Vert OFF
Zoom IN :
Zoom OUT
Auto Tracking
Move Chart :
Center
Order :
12
Redraw
SUM
DIFF
SUM AA SKEW
DIFF AA SKEW
SKEW
SATELLITE
CHART
Indicator
Q-Phase Stages
Longitudinal Tune
Transverse Tune Deviation
Q control activity
Transverse Tune Deviation
20
5
-10
-25
0
100
200
300
400
500
HOR
VERT
Average:
Run / Stop
Running
Cursor Coordinates
Horizontal
Vertical
Tune:
11.339 kHz
Tune:
14.908 kHz
Q:
0.23965
Q:
0.31506
Resonance at Cursor
+ 2 Qx + 8 Qz = 3

HERA-p tunes and beam excitation at 40 GeV



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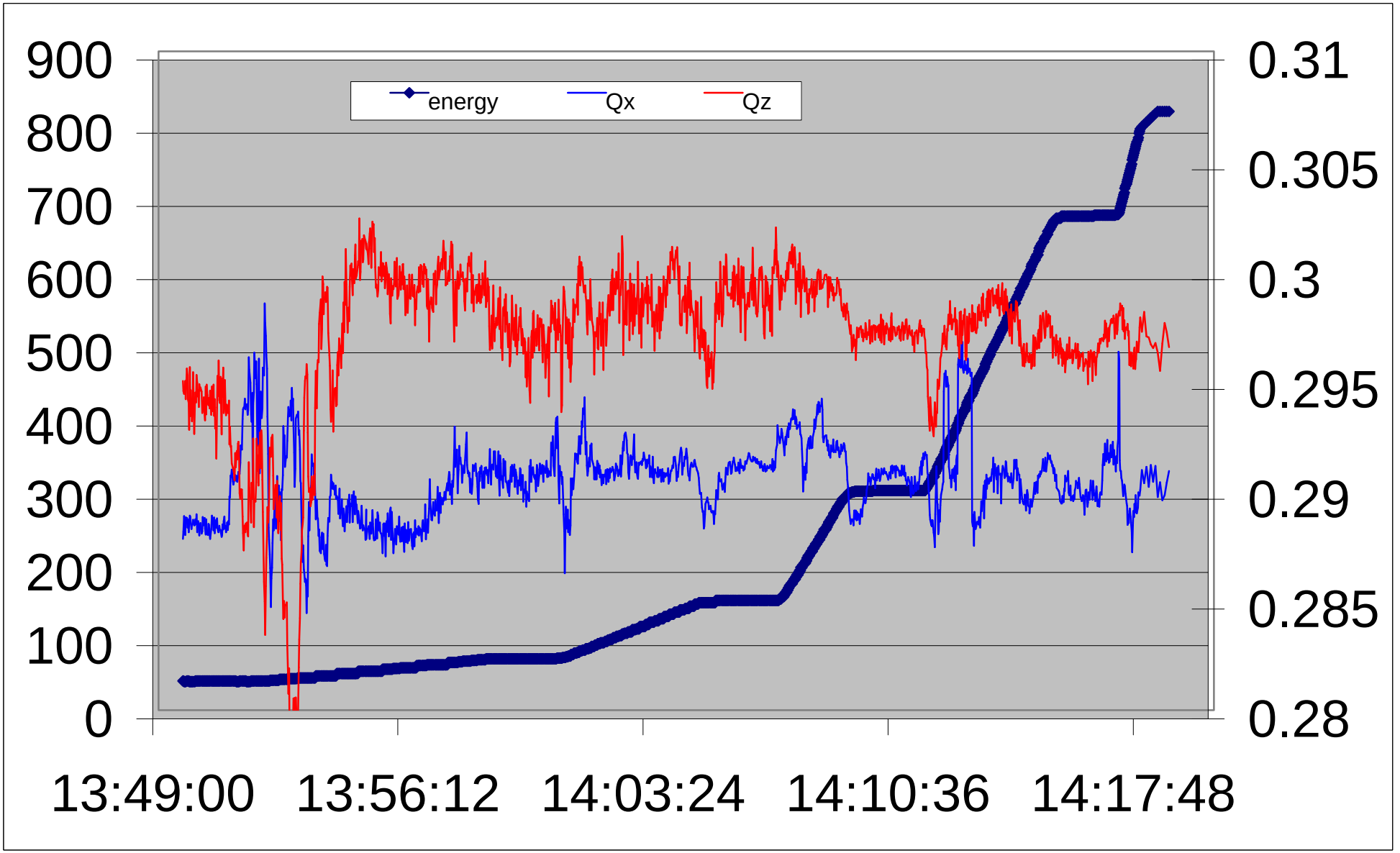
HERA-p hor. and vert. tunes during ramp



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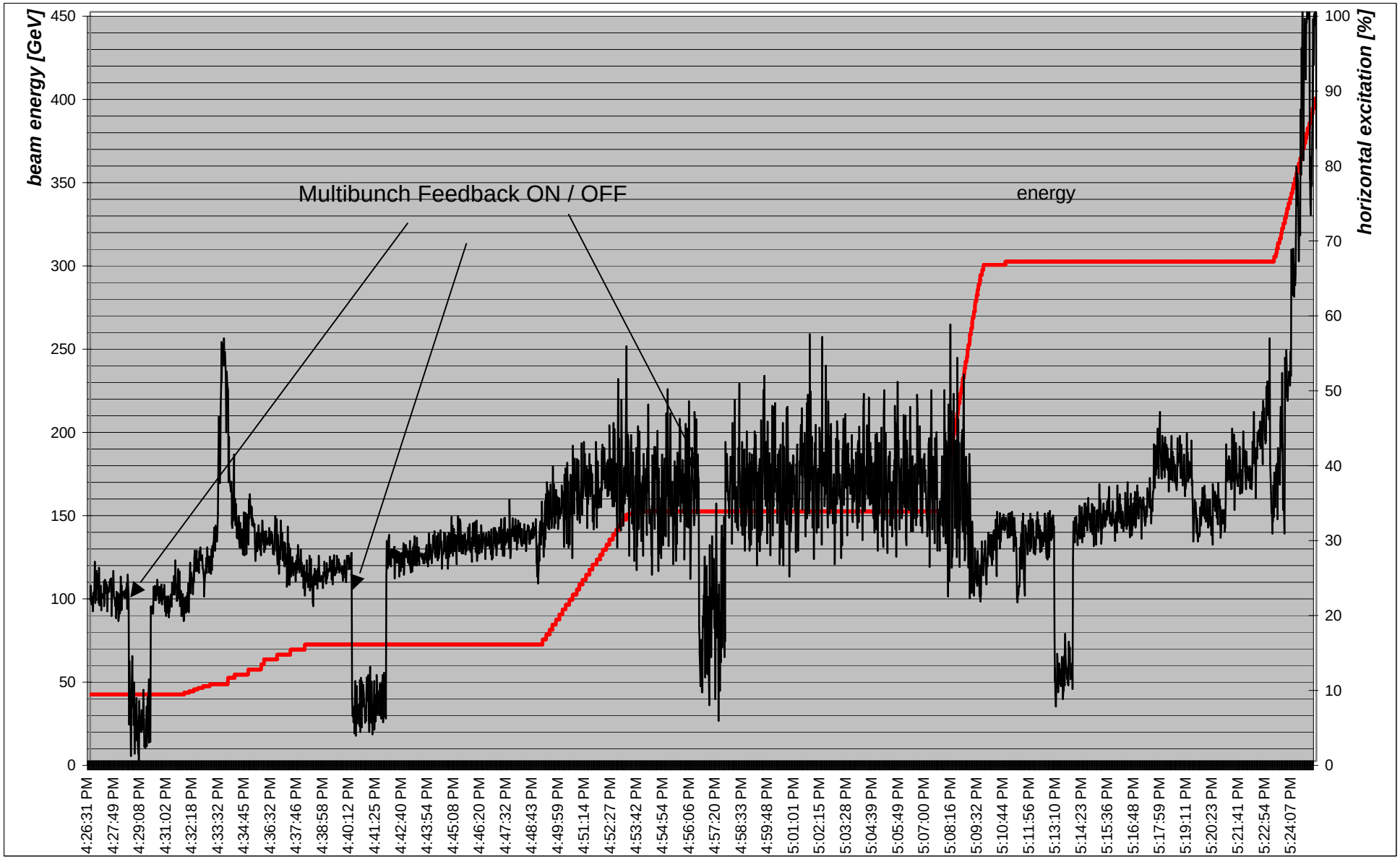
Tune Indicator excitation amplitude due to beam response



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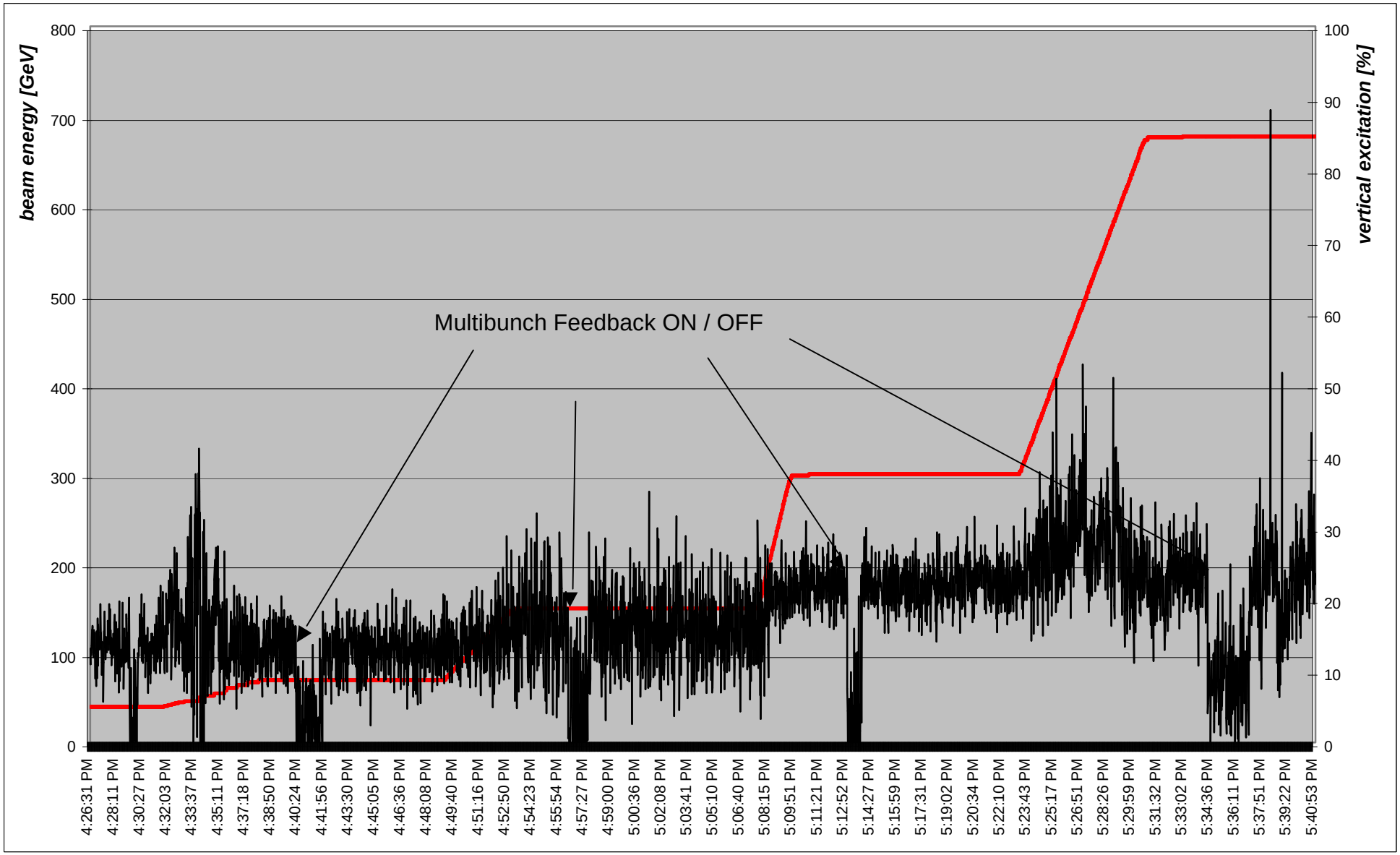
Tune Indicator excitation amplitude due to beam response



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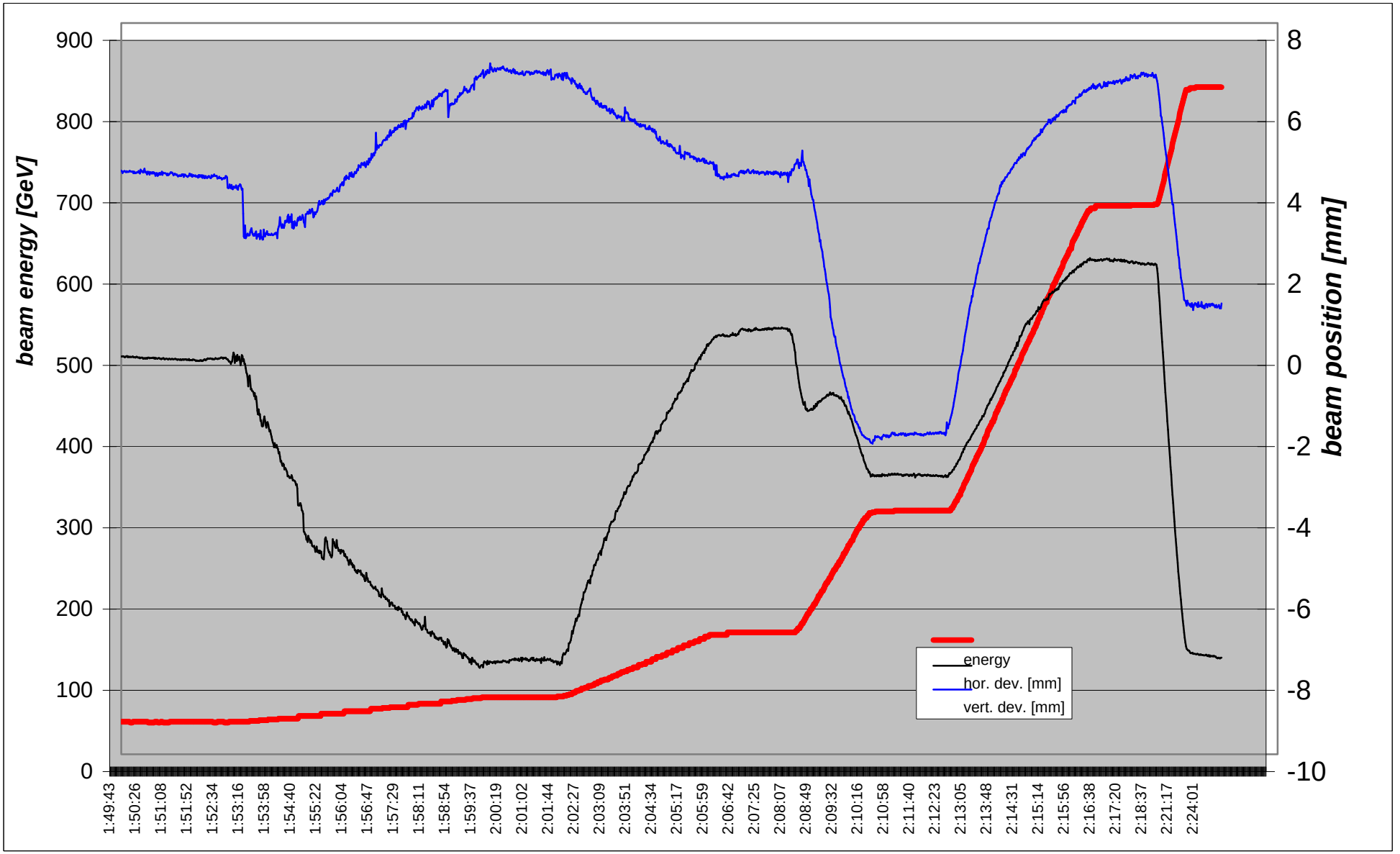
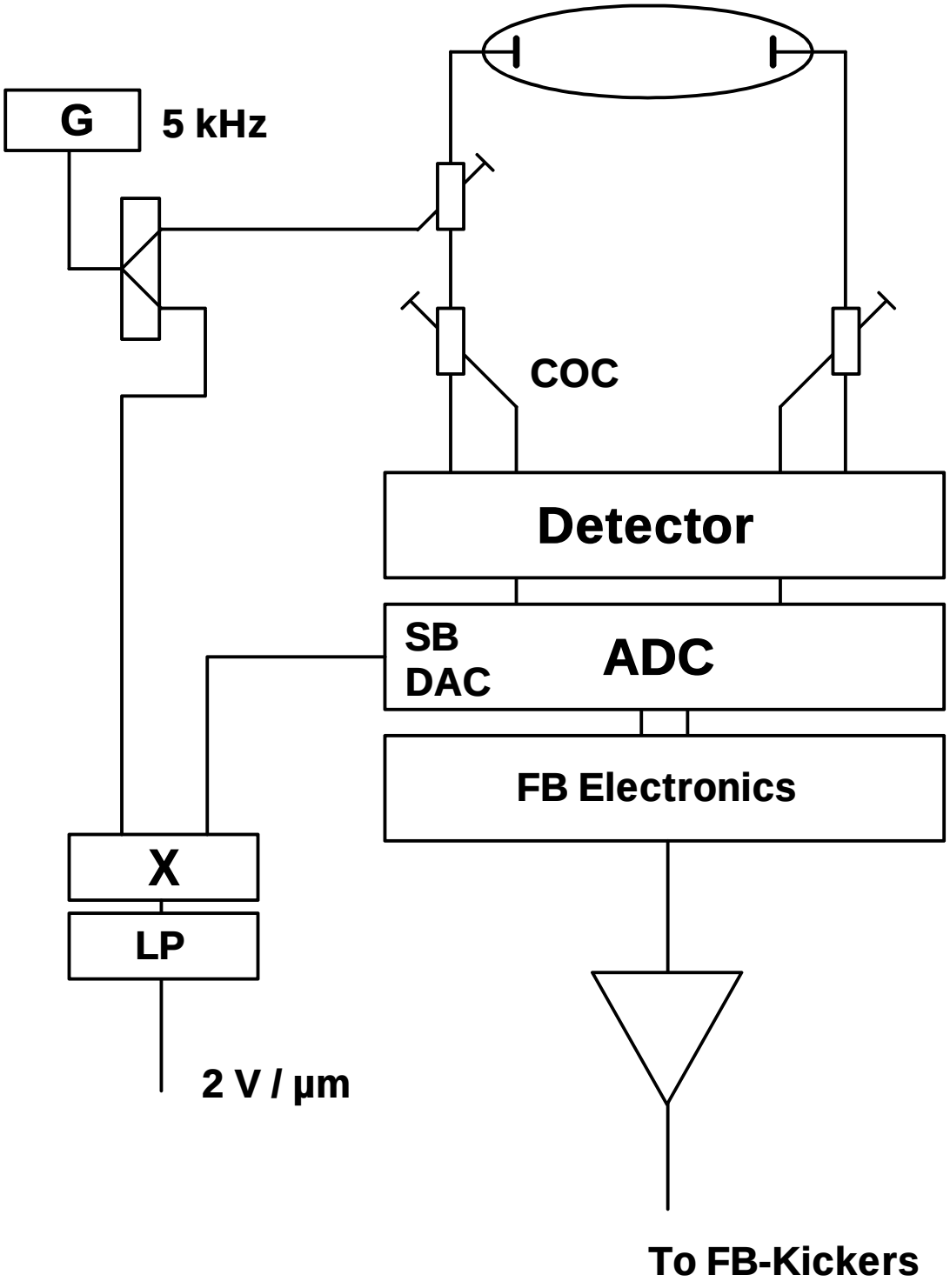
hor. and vert. beam deviations at monitor



Sensitivity Measurement by using a Pilot Tone at 5 kHz



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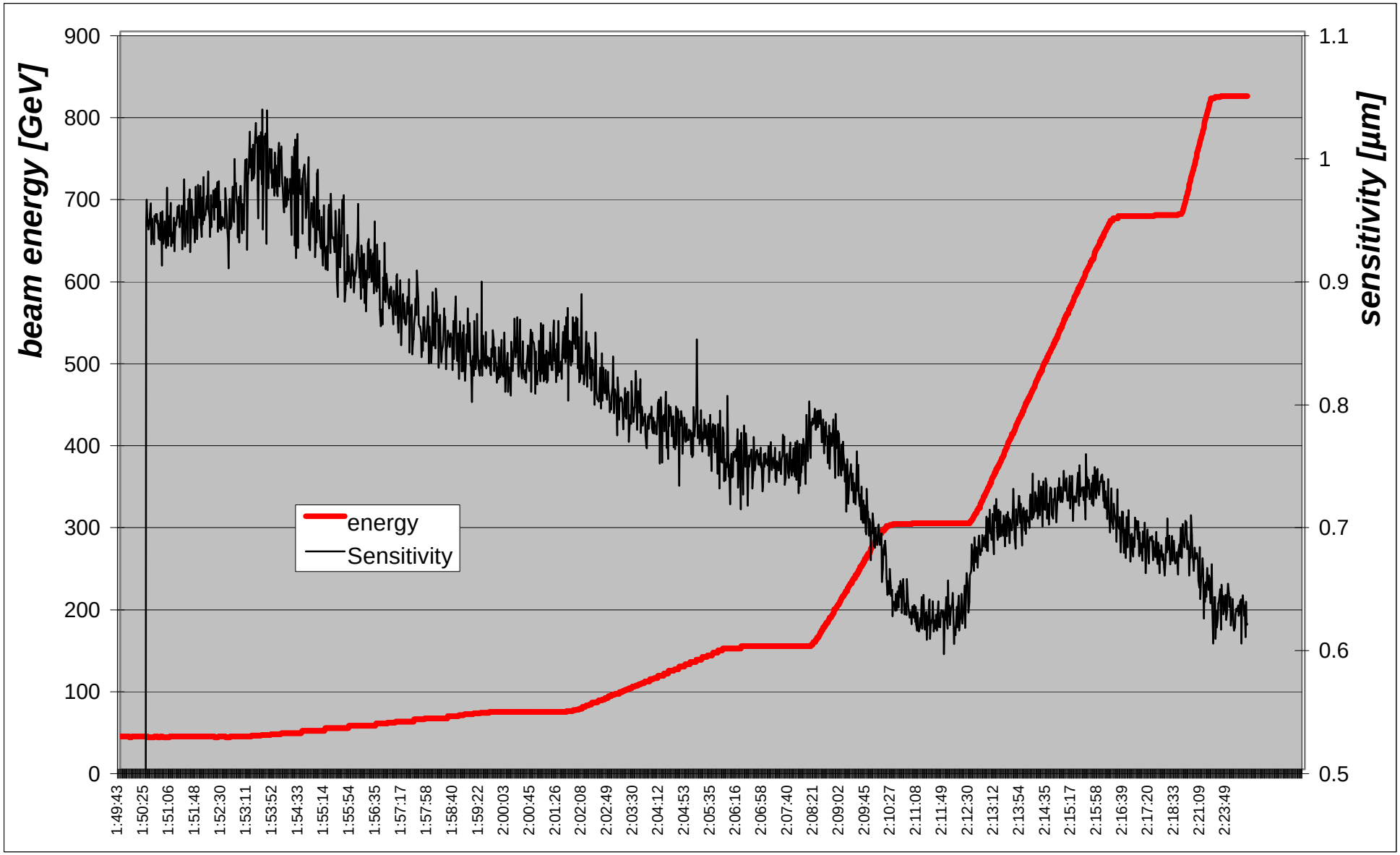
sensitivity of the detector vs. beam energy



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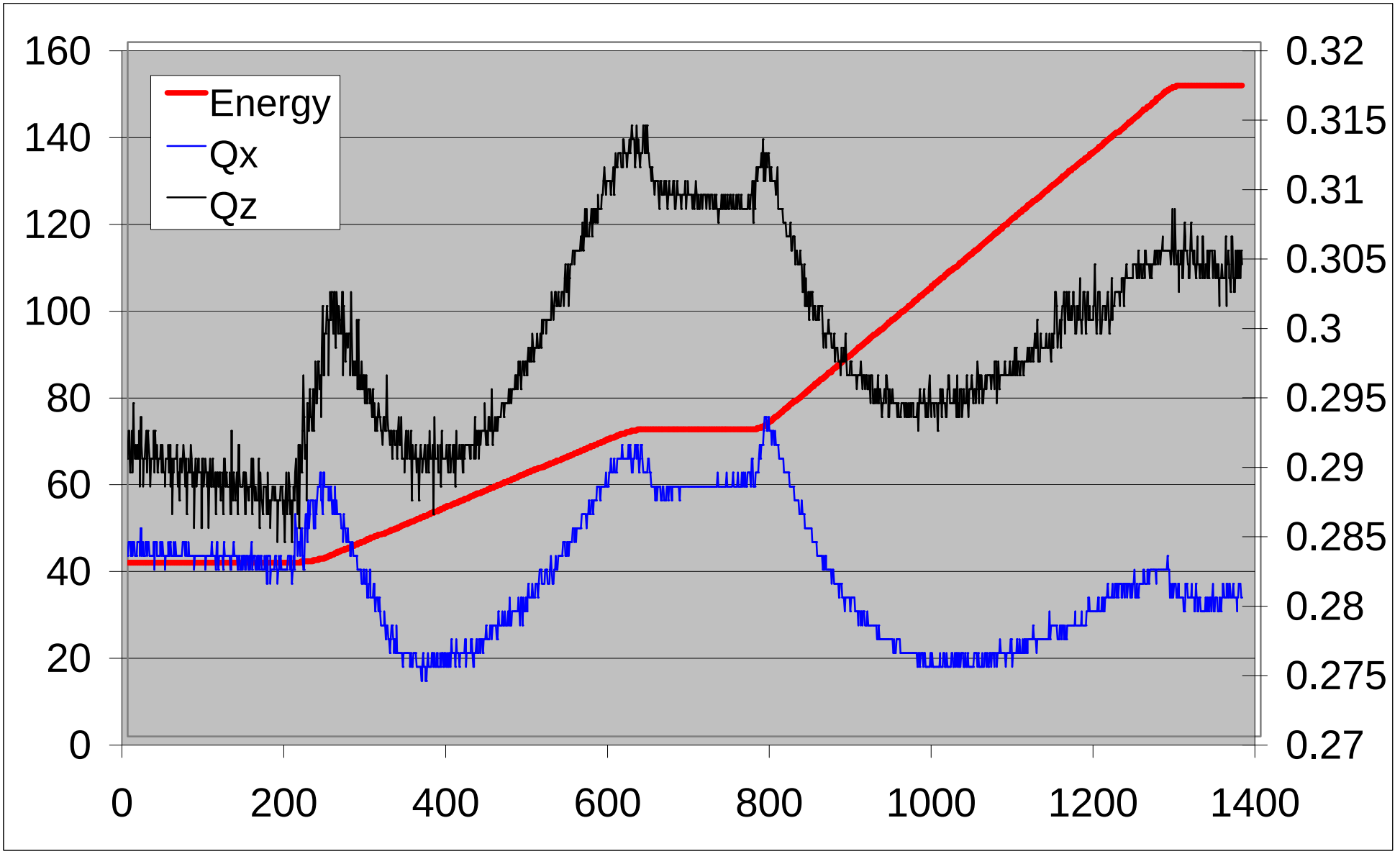
HERA-p ramp without RF modulation



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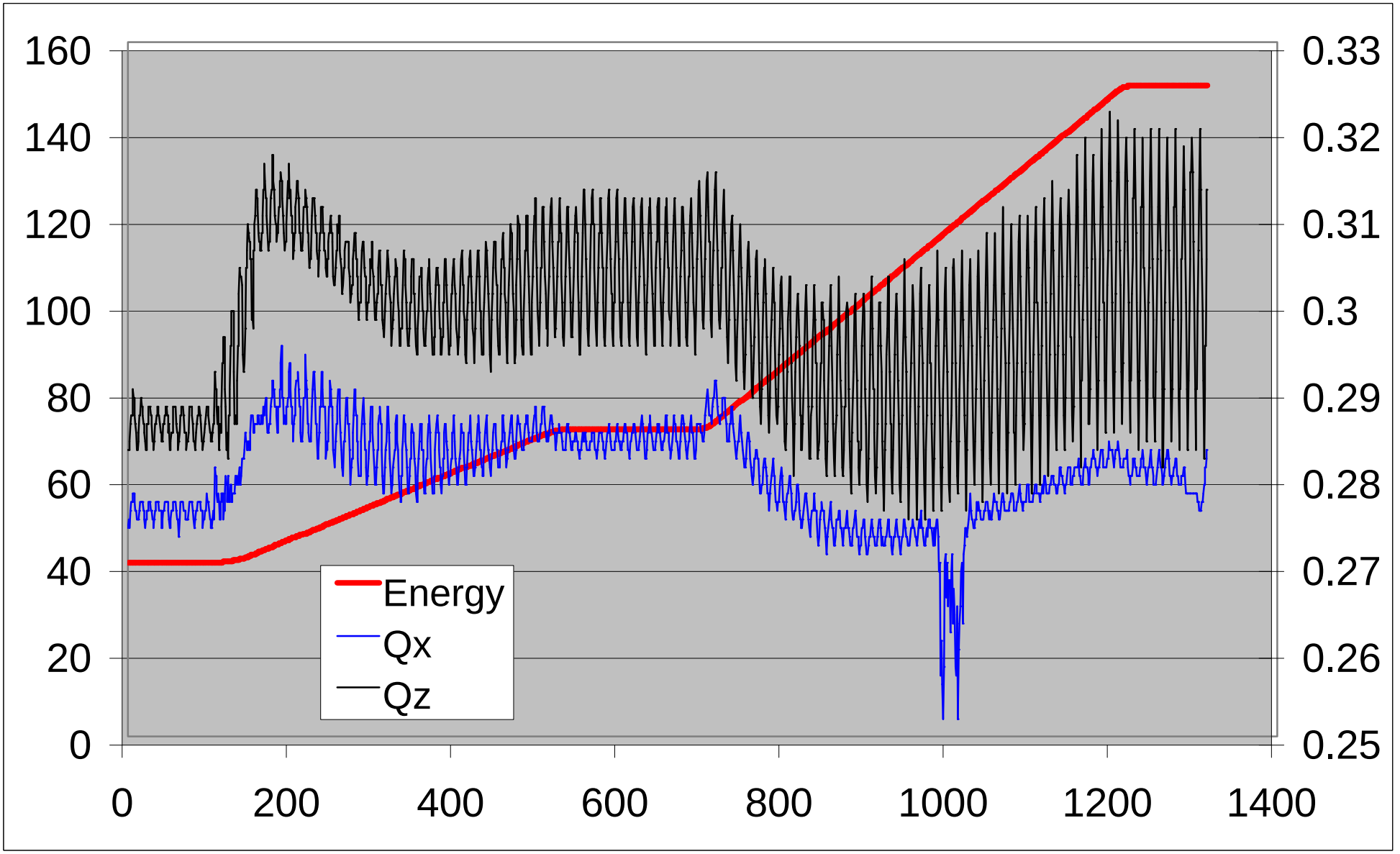
HERA-p ramp with RF modulation swing of 50Hz



J. Klute DESY 6/17/02 data from Juli 1997