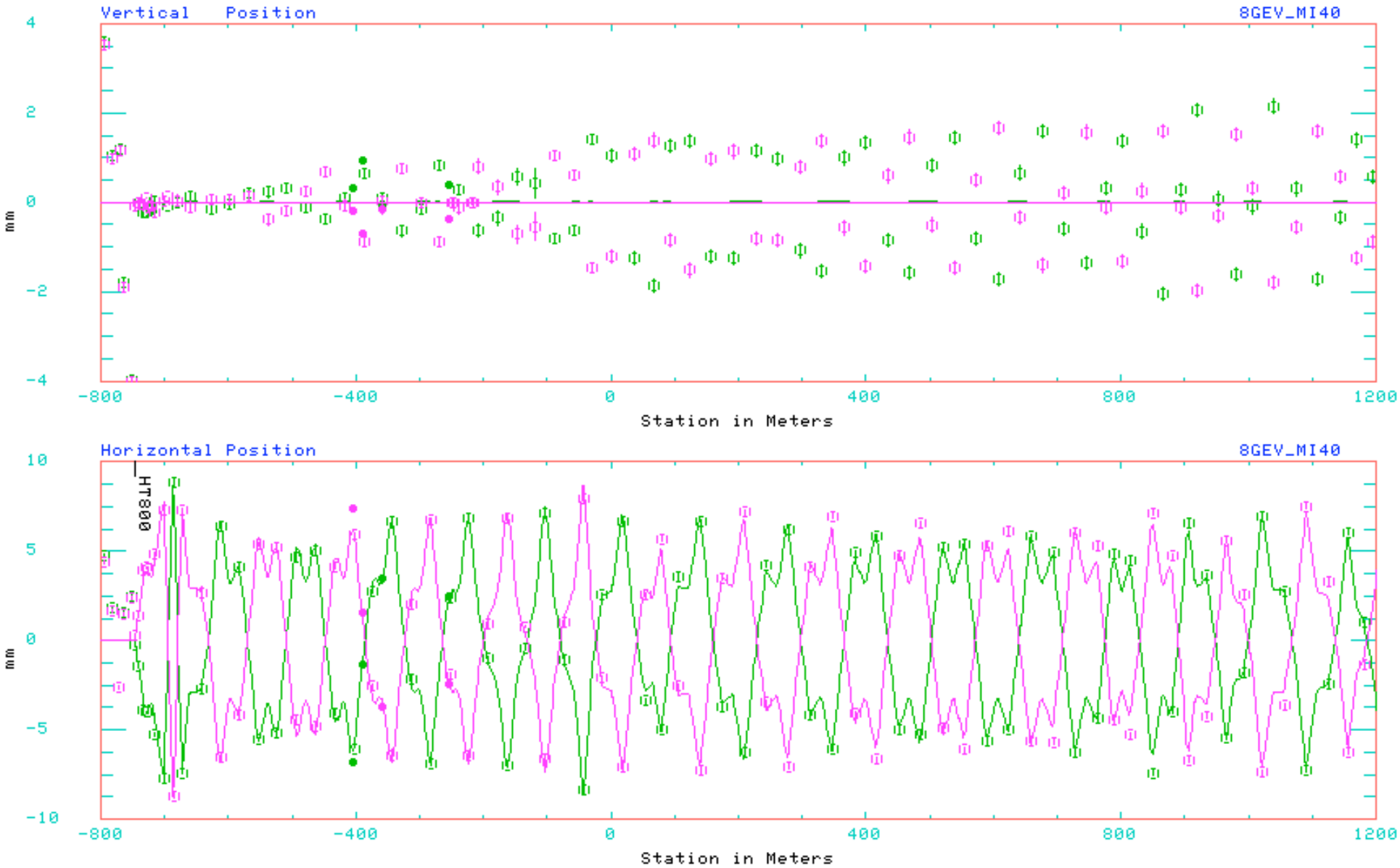
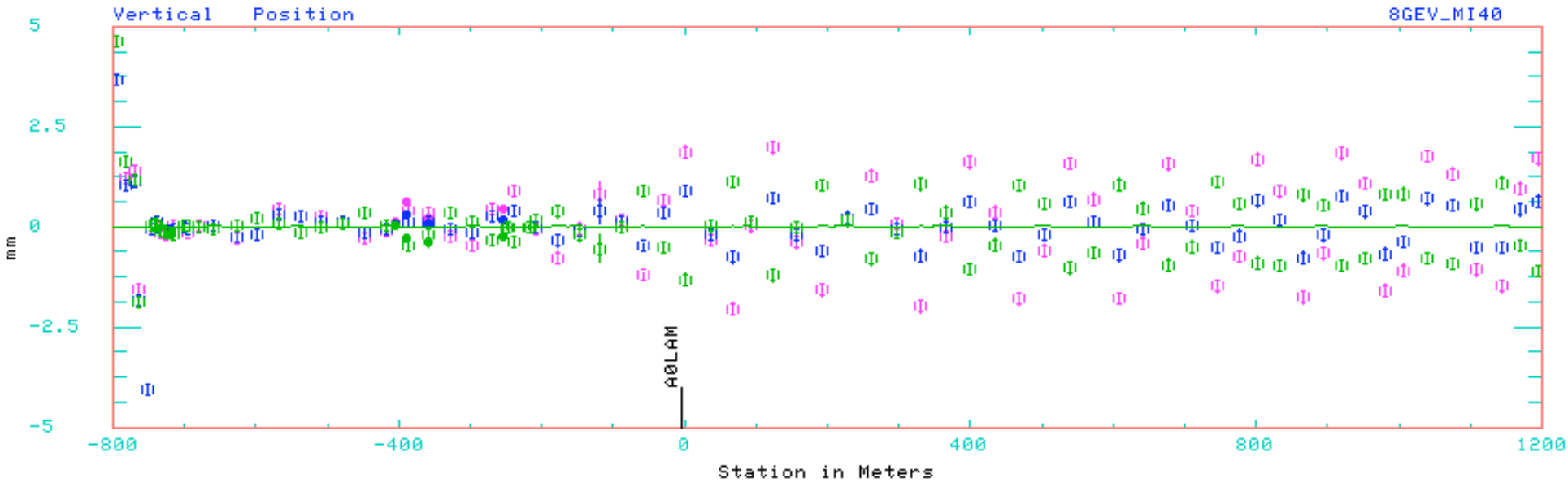
MI8 line lattice study

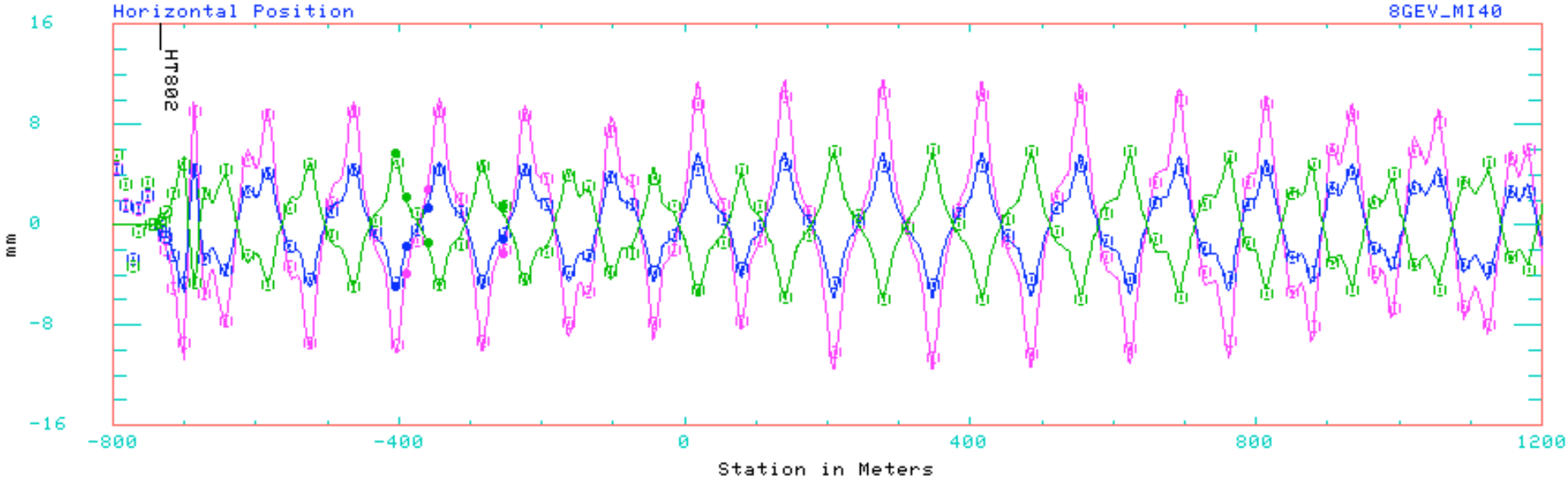
- Optics
  - Horizontal 1-bump orbits
    - ht800, ht802, ht804.
  - Vertical plane 1-bump orbits
    - Closed MP02/vt819/vt821 bump.
      - Adjust up-stream quad currents.
    - Vertical plane: vt805 & vt807.
      - Adjust down-stream quad currents.
- Profile sigma data
  - From Booster cycle $14.

MI8 line 1-bump orbit, HT800

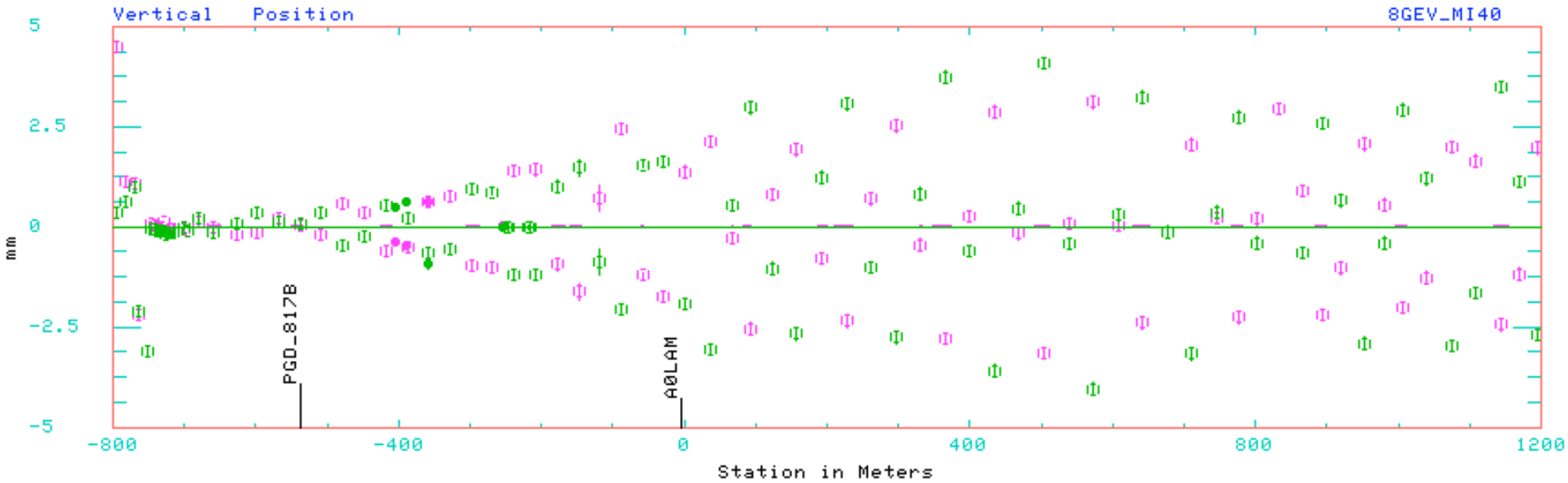


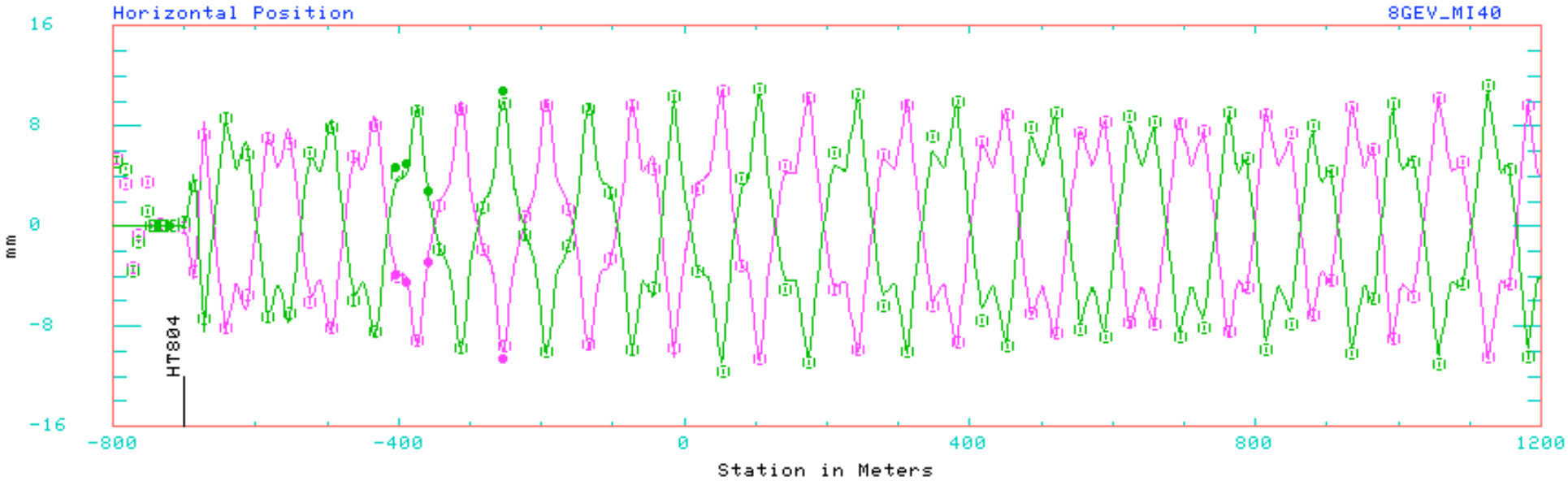
MI8 line 1-bump orbit, HT802



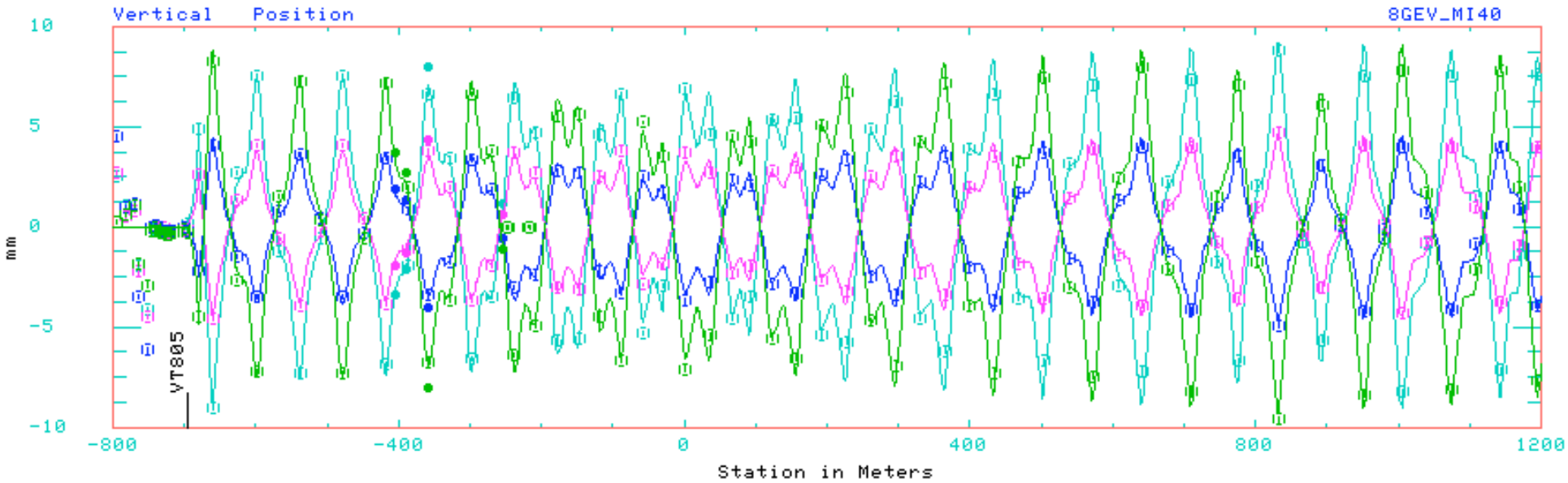


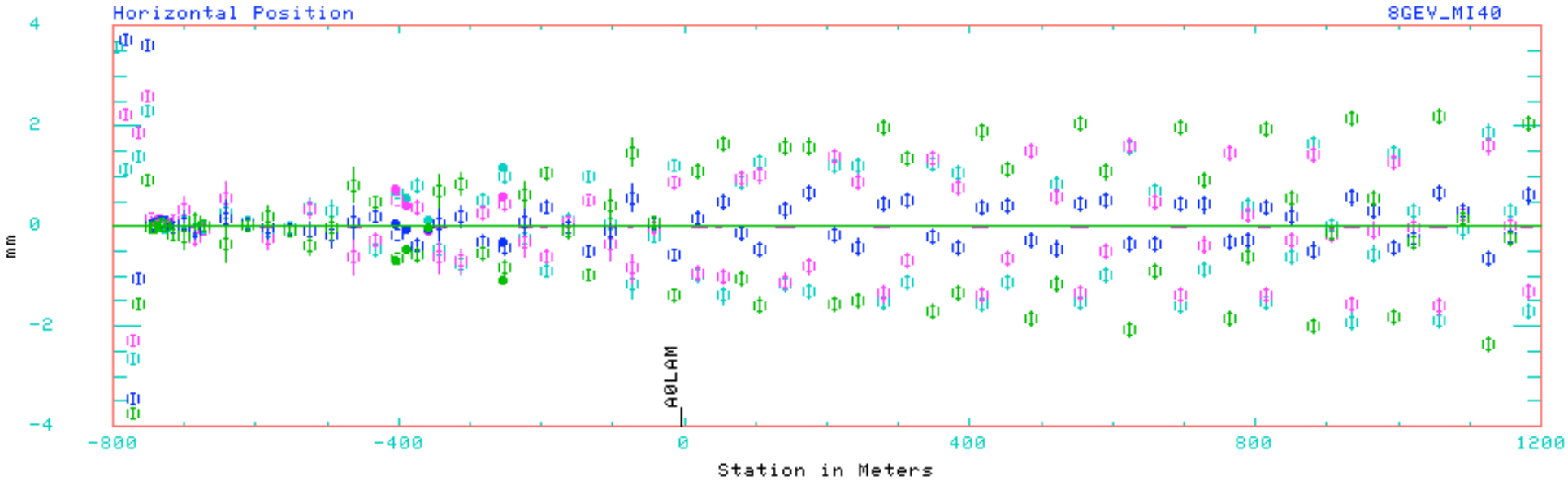
MI8 line 1-bump orbit, HT804



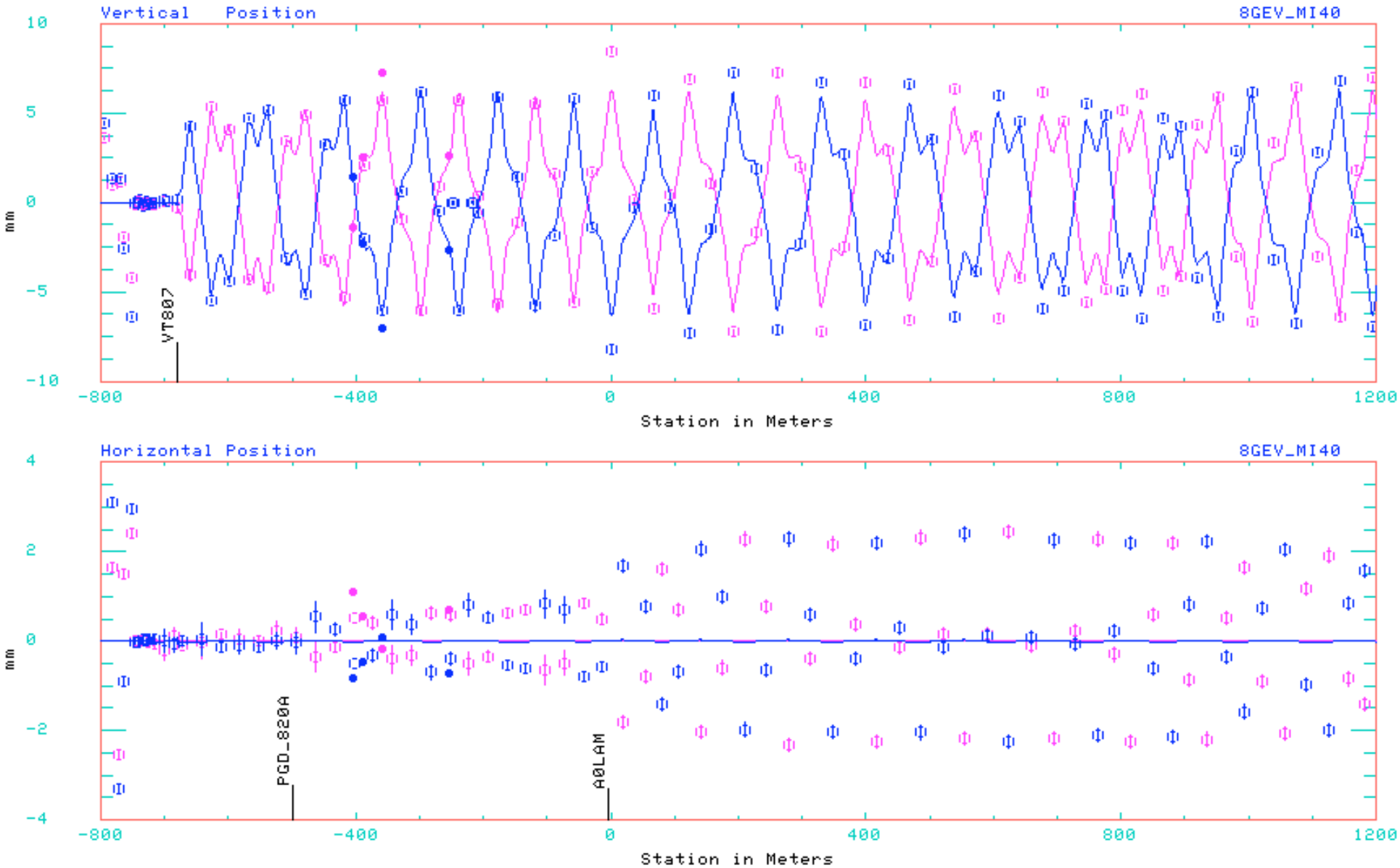


MI8 line 1-bump orbit, vt805

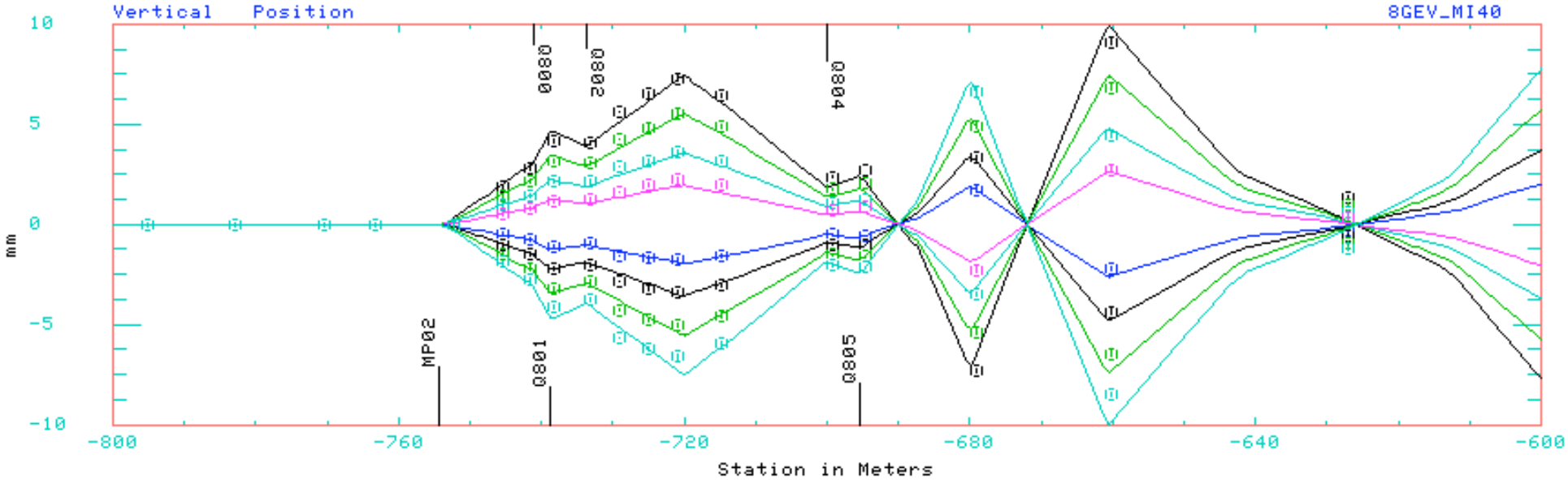




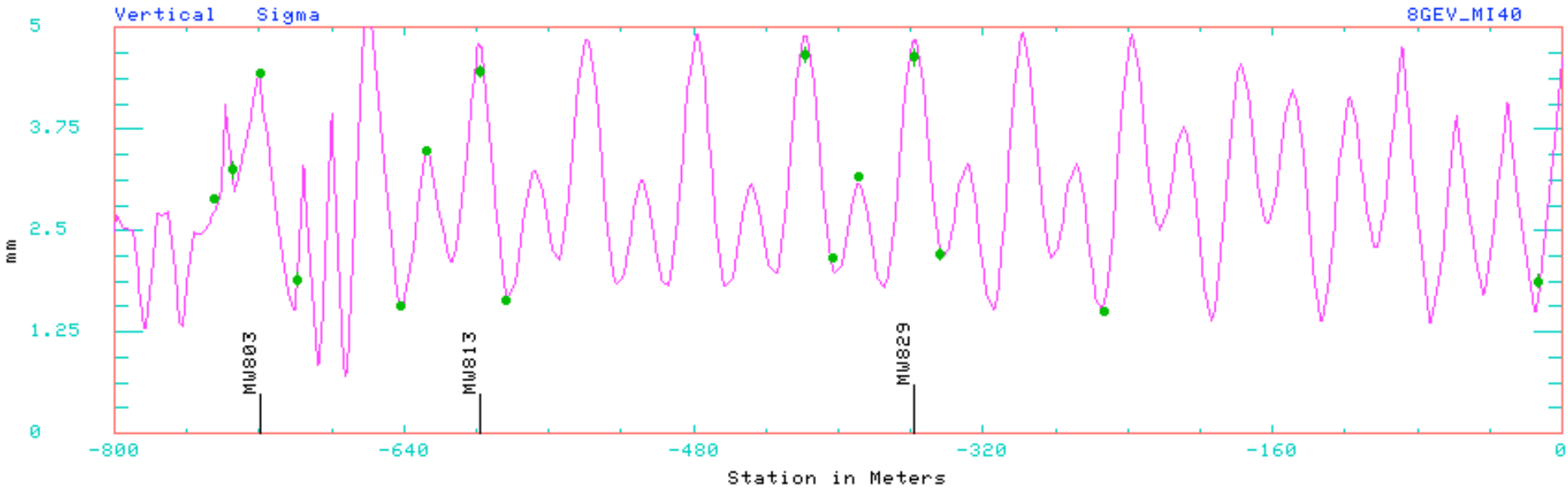
MI8 line 1-bump orbit, VT807

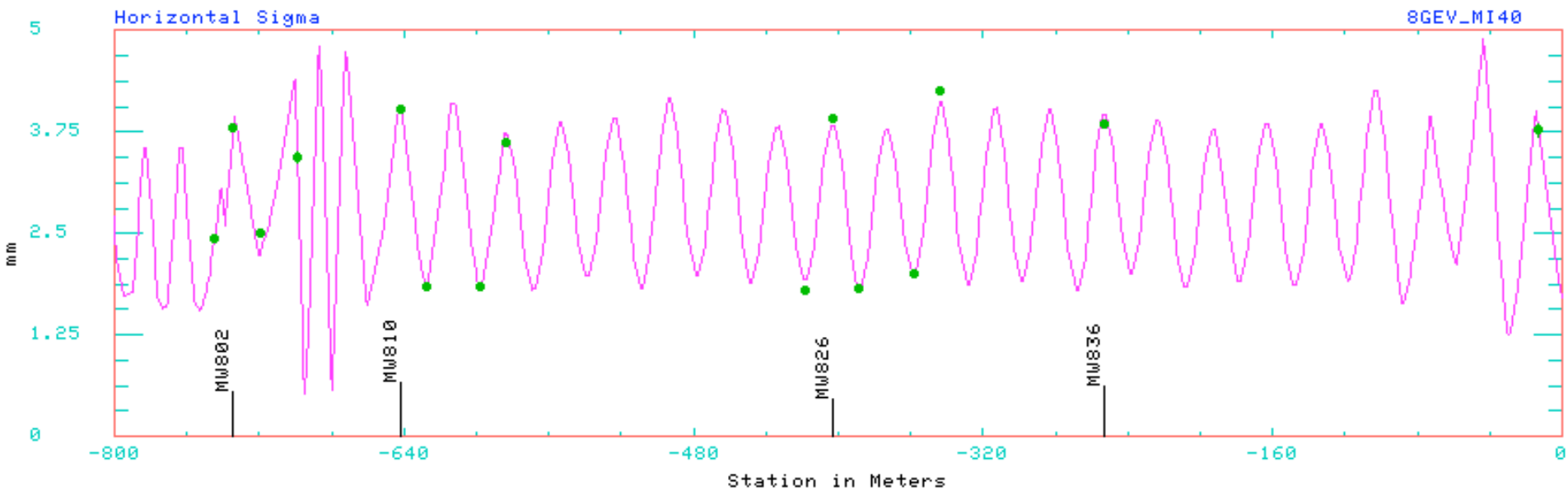


MI8 line orbit, MP02



MI8 line sigma on $14s

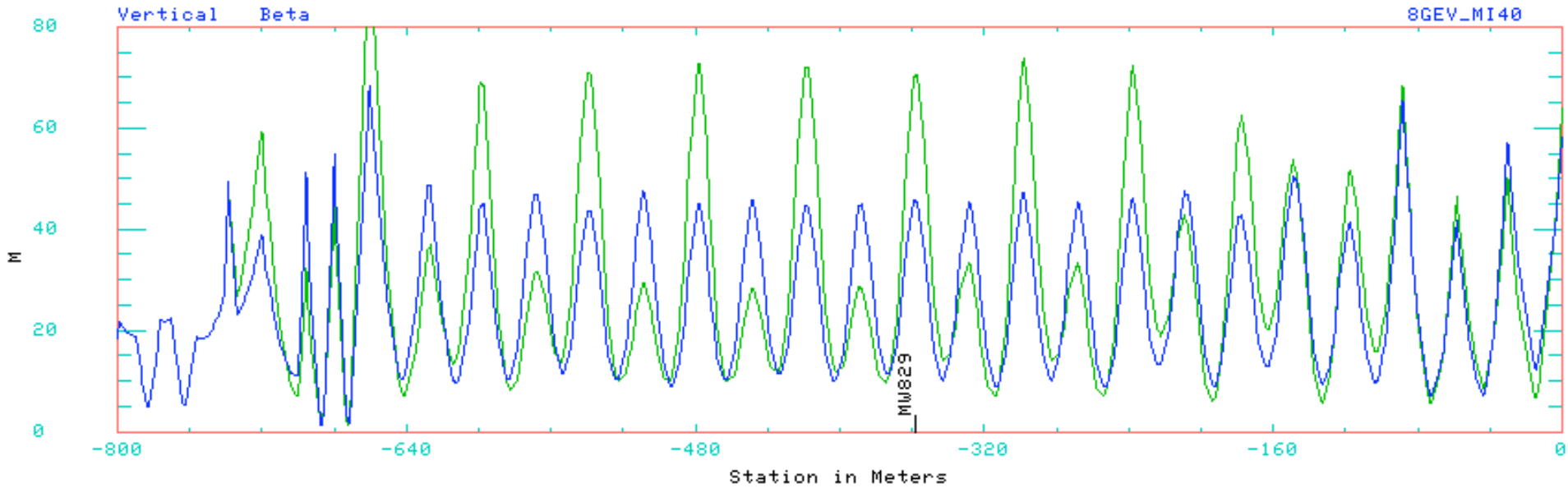


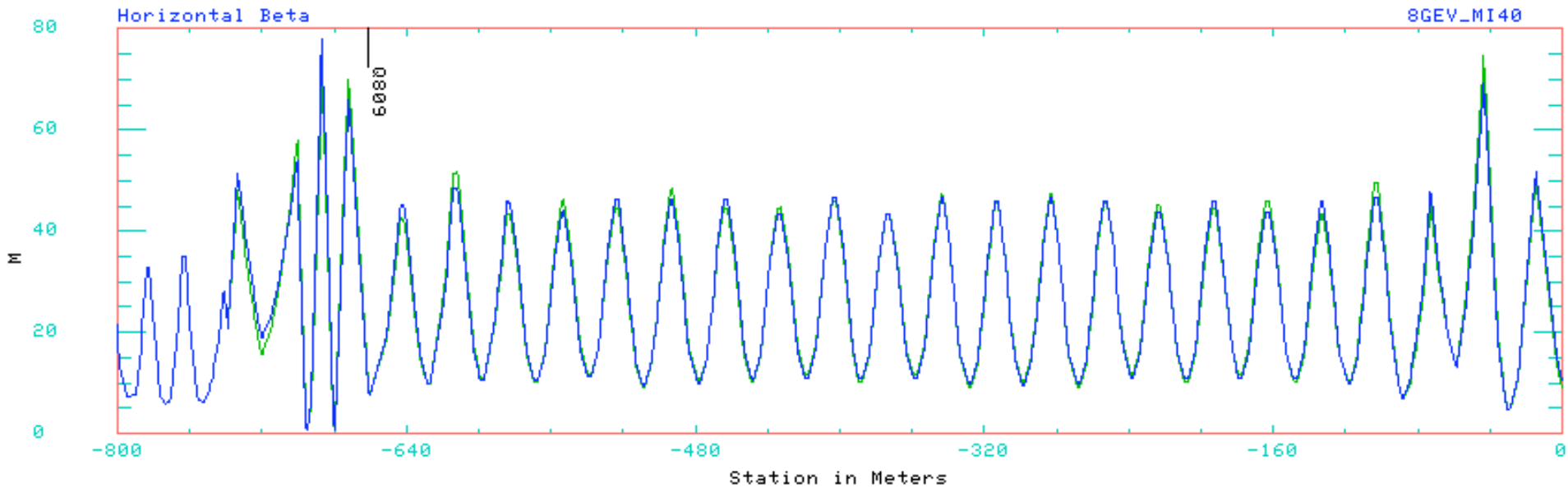


Fitted emittances & initial lattice

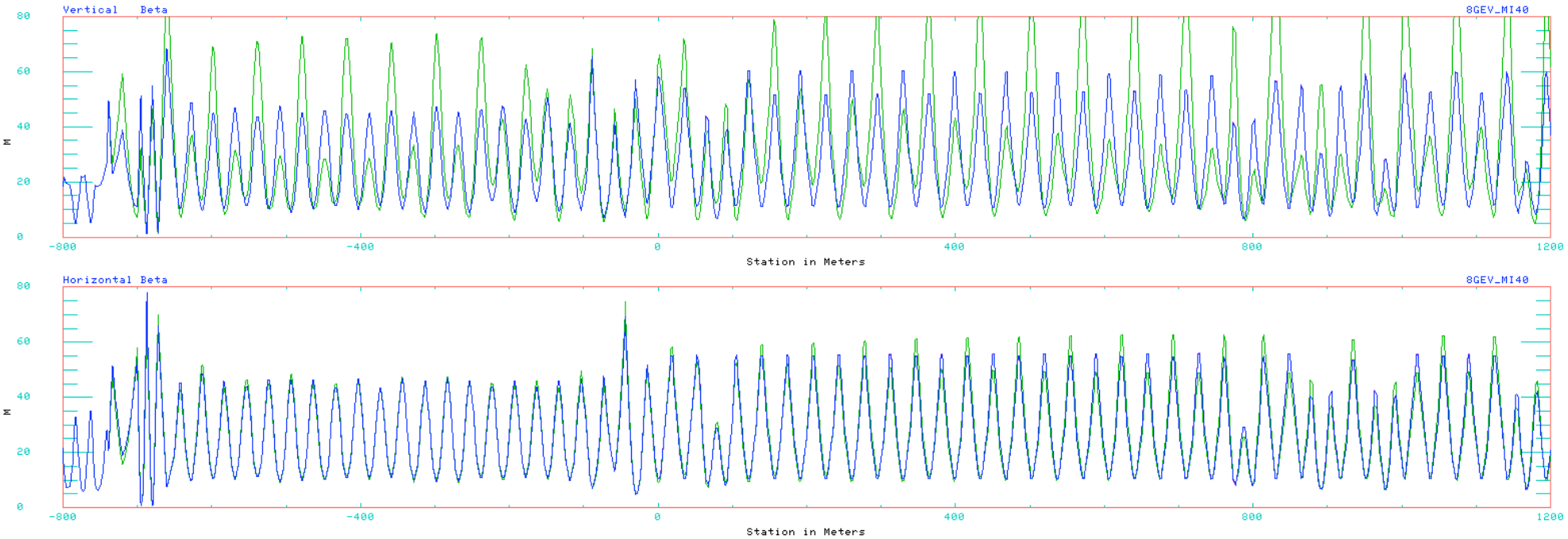
```
                    Lattice parameters
 Select: [8GEV_MI40    ] as [Transfer line]
 Start at element: [BOO_CELL01] for [Proton     ]
*Track: [Lattice function] at ( 8      ) GeV

Lattice       Horz          Vert
     Phase: ( 24.5361)   ( 23.6277) 2π
      Beta: ( 55.9    )   ( 6.85   ) M
     Alpha: (-.304    )   (-.103   )
       eta: (-3.189   )   ( .065   ) M
      etap: (-.011    )   (-.013   )
Beam
  Position: ( 0       )   ( 0      ) mm
     Angle: ( 0       )   ( 0      ) mr
 Emittance: ( 3.0198  )   ( 3.14557) π-mm-mr
            ± .07903      ± .275685
      ΣP/P: ( .4038   ) ±  .07405    E-3
      ΔP/P: ( 0       )              E-3

*Fit emittance: [None           ]
 Momentum sigma from [Horizontal] plane

*Update [reference orbit]
 Graphic window link: [GxPB 2]
*Set lattice to [Linear] order and with [Matrix]

 <Exit>
```

MI8 line beta





MI injection beta



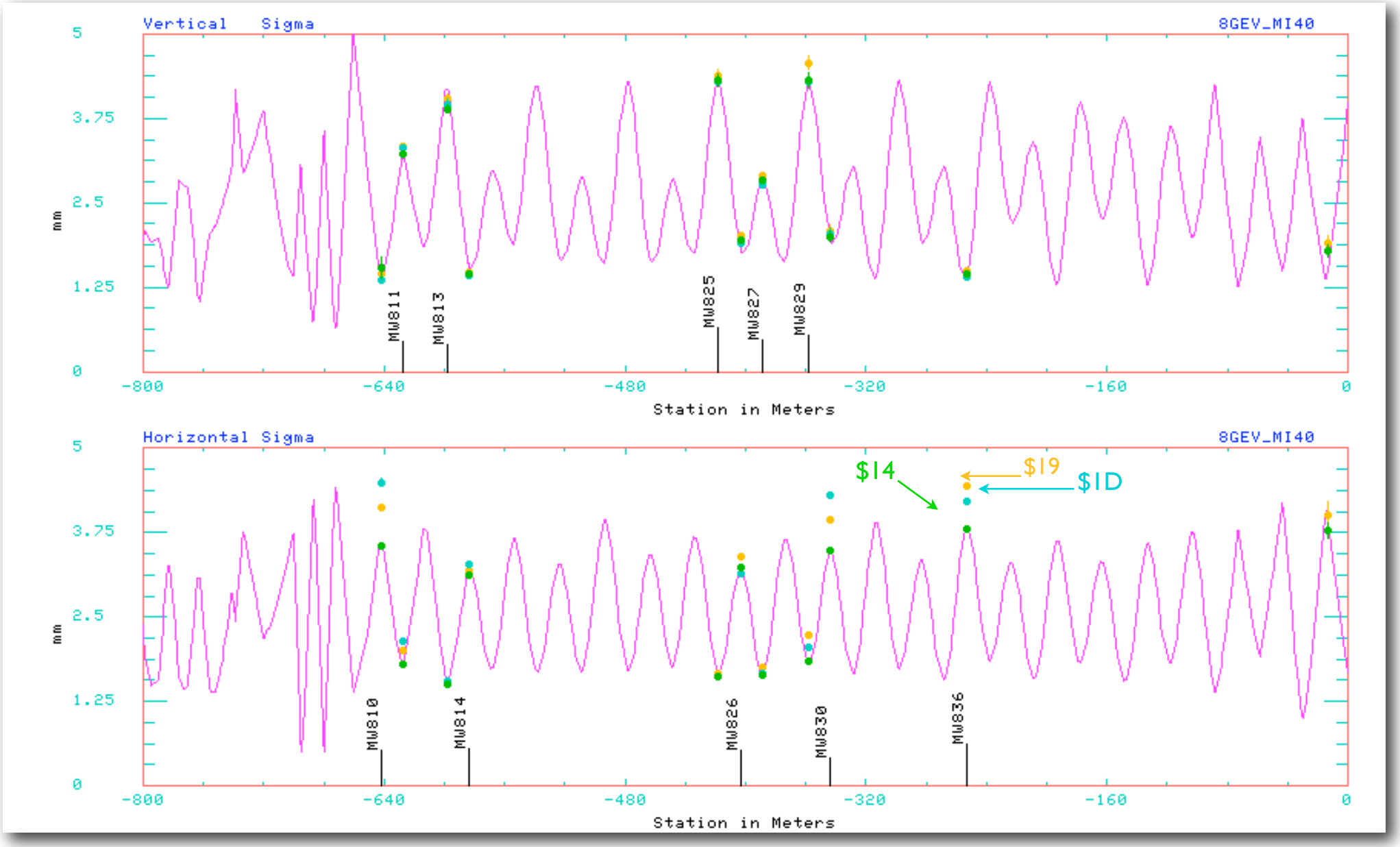
Settings of MI8 line quads

DB_name		Setting	Reading		Used	Matched	delta	New setting	
Q800	AMP	211.2496	211.915		211.6619	211.6619	0	211.2496	211.2496
Q801	AMP	173.3199	172.265		180.2619	190.2619	10	183.3199	183.3199
Q802	AMP	167.6053	168.7213		166.9559	166.9559	0	167.6053	167.6053
Q803	AMPS	101.001	102.2875		116.3875	100.3875	-16	85.001	85.001
Q804	Amps	225.5496	226.155		225.7419	225.7419	0	225.5496	225.5496
Q805	Amps	245.6096	245.755		245.5819	245.5819	0	245.6096	245.6096
Q806	Amps	164.5053	165.7613		166.9559	163.9559	-3	161.5053	161.5053
Q807	Amps	149.7053	151.1613		150.3959	150.3959	0	149.7053	149.7053
Q808	Amps	201.6199	199.985		200.1019	203.1019	3	204.6199	204.6199
Q809	Amps	203.6199	201.985		204.1419	204.1419	0	203.6199	203.6199
Q847	Amps	160.5827	159.0162		156.9113	163.6113	6.7	167.2827	167.2827
Q848	Amps	145.5427	143.9862		145.9113	145.6113	-0.3	145.2427	145.2427
Q849	Amps	171.5027	169.7262		169.6613	171.1613	1.5	173.0027	173.0027
Q850	Amps	162.9827	161.3962		165.3213	165.7213	0.4	163.3827	163.3827
Q851	Amps	149.1027	147.5262		164.0513	152.0513	-12	137.1027	137.1027
Q852	Amps	164.5227	162.8862		171.8013	166.9013	-4.9	159.6227	159.6227
B:Q800S	Amps	43.74	43.085		43.3225	43.3225	0	43.74	43.74
B:Q801S	Amps	42.18	41.485		33.7225	23.7225	-10	32.18	32.18
B:Q802S	Amps	15.6	15.685		15.8425	15.8425	0	15.6	15.6
B:Q804S	Amps	29.44	28.845		29.2425	29.2425	0	29.44	29.44
B:Q805S	Amps	9.38	9.245		9.4025	9.4025	0	9.38	9.38
B:Q806S	Amps	18.7	18.645		15.8425	18.8425	3	21.7	21.7
B:Q807S	Amps	33.5	33.245		32.4025	32.4025	0	33.5	33.5
B:Q808S	Amps	13.88	13.765		13.8825	10.8825	-3	10.88	10.88
B:Q809S	Amps	11.88	11.765		9.8425	9.8425	0	11.88	11.88
I:Q847S	Amps	10.92	10.9025		17.9325	11.2325	-6.7	4.22	5.72
I:Q848S	Amps	25.96	25.9325		28.9325	29.2325	0.3	26.26	27.76
I:Q849S	Amps	0	0.1925		5.1825	3.6825	-1.5	-1.5	0
I:Q850S	Amps	8.52	8.5225		9.5225	9.1225	-0.4	8.12	9.62
I:Q851S	Amps	22.4	22.3925		10.7925	22.7925	12	34.4	35.9
I:Q852S	Amps	6.98	7.0325		3.0425	7.9425	4.9	11.88	13.38
B:Q800	AMP	254.9896	255		254.9844	254.9844	0	254.9896	254.9896
B:Q801	AMP	215.4999	213.75		213.9844	213.9844	0	215.4999	215.4999
B:Q802	AMP	183.2053	184.4063		182.7984	182.7984	0	183.2053	183.2053
B:Q803	AMPS	101.001	102.2875		116.3875	100.3875	-16	85.001	85.001
I:Q847	AMP	171.5027	169.9187		174.8438	174.8438	0	171.5027	173.0027

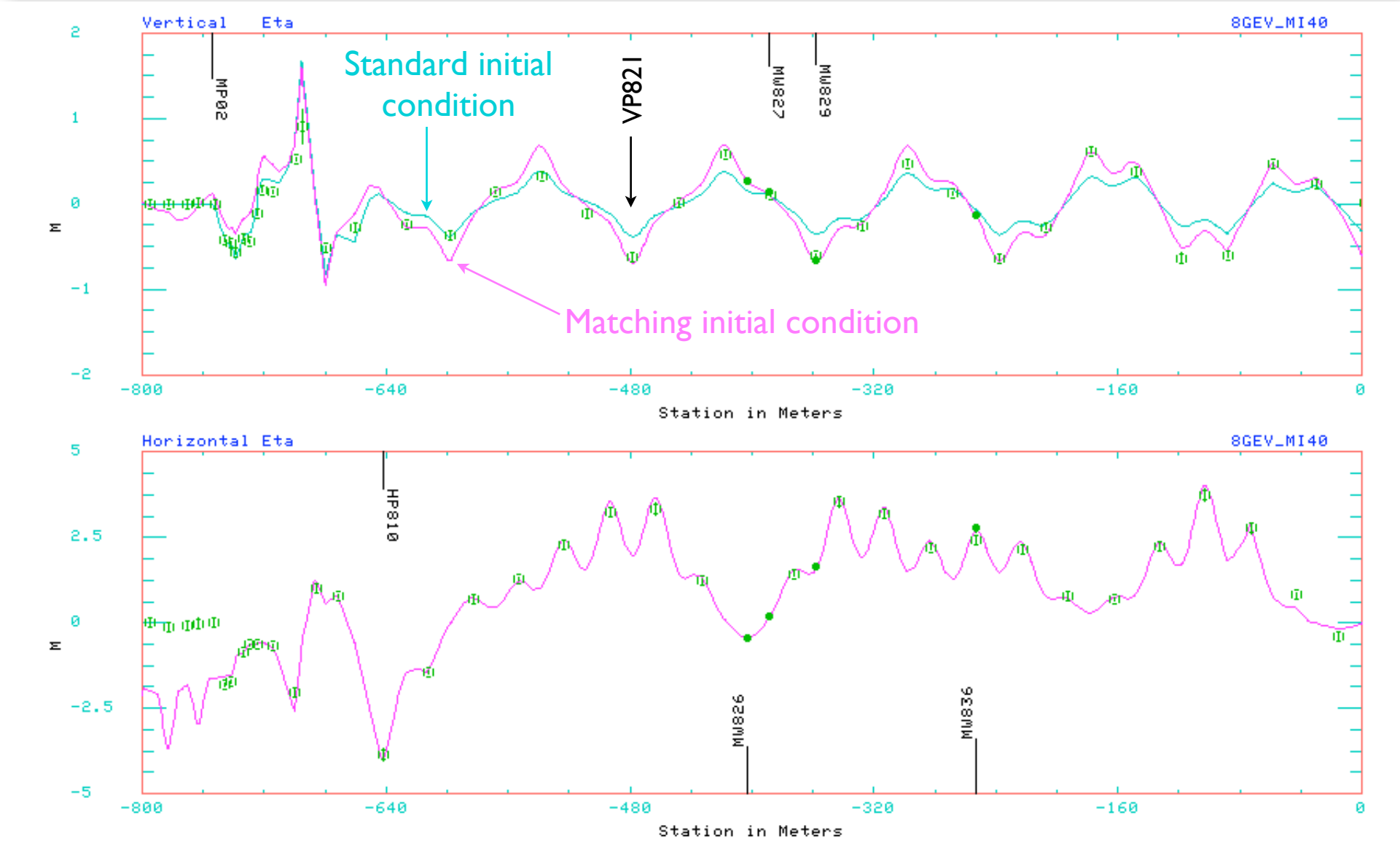
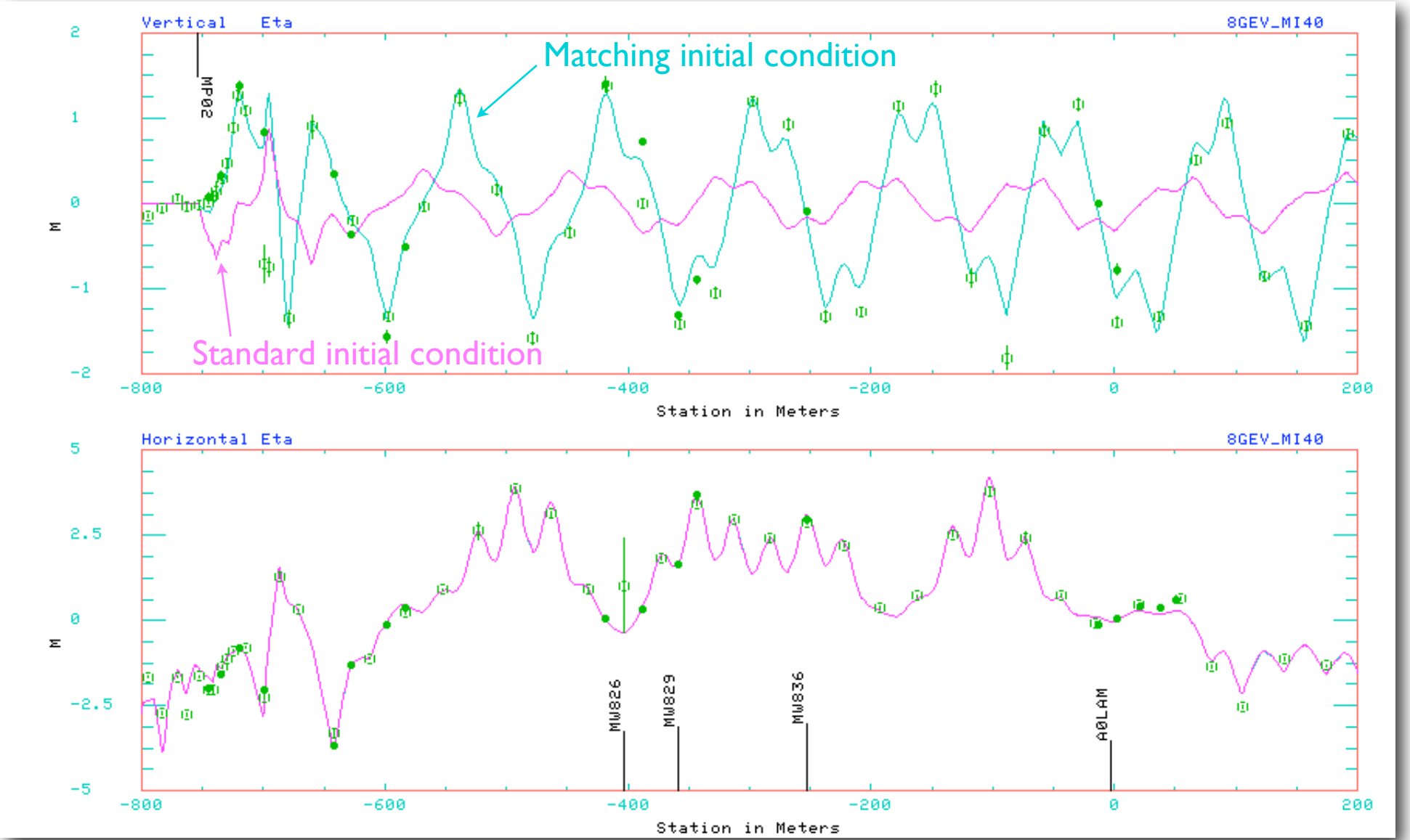
Disclaimers

- Optics study without multiwire
  - BPM calibration
    - Up-stream MI8 line.
    - Between MI8 line and MI.
- MI8 line stabilities
  - Orbit
    - B:Q801 has Booster RF feed-thru problem.
  - Optics
    - Profile sigma between MW826 and MW836 has changed.
  - Vertical dispersion function
- Coupling
  - May affect sigma.

Profile sigma, from Sept. 08



Measured dispersion function



MI8 line dispersion at June start-up