

Rematch DR & EXT Optics for QM7R Gradient Error

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ATF2 Weekly Meeting
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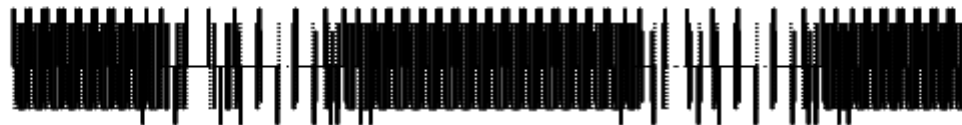
Matching Procedure

In EXT:

1. apply gradient error to QM7R (0% to -50%)
2. rematch EXT using QF1X-QF9X; also allow Twiss at IEX to vary
3. propagate fitted Twiss from IEX to entrance of QM7R

In DR:

1. vary QF2R and QF1R to get (approximate) phase advance per FOBO cell
2. starting with periodic FOBO cell Twiss in West arc, vary QM1R-QM6R to zero dispersion at start of North straight and match desired Twiss at entrance to QM7R (6 variables / 6 constraints)
3. vary QM15R-QM19R, QM22R, and QM23R to match back to periodic FOBO cell Twiss in East arc
4. vary everything again to rematch including the tunes (15.18/8.57)

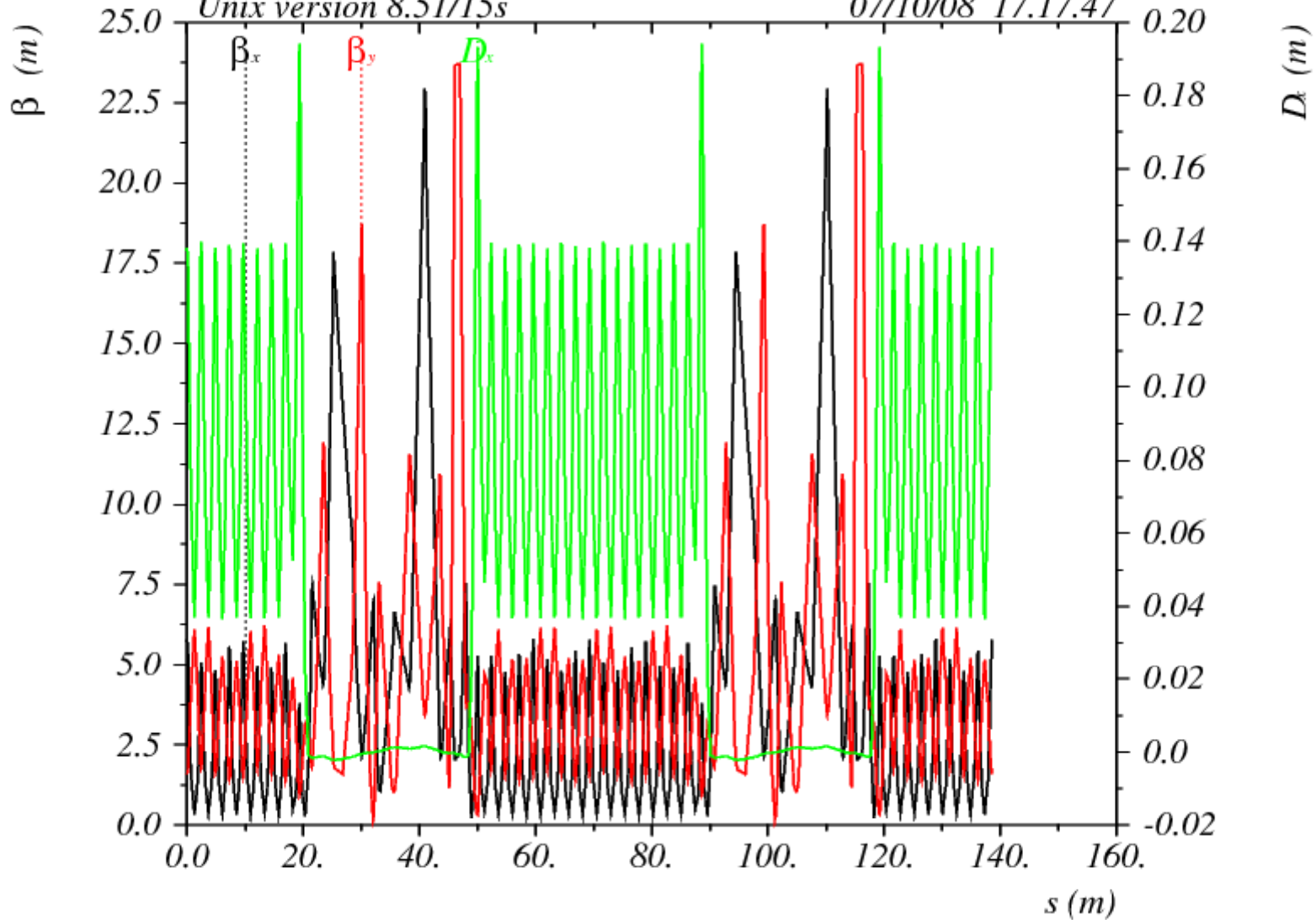


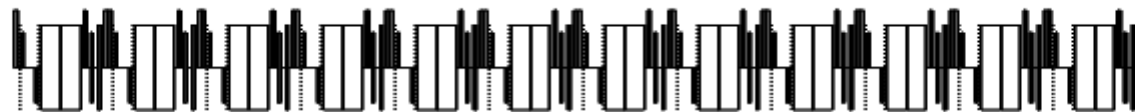
nominal

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.17.47

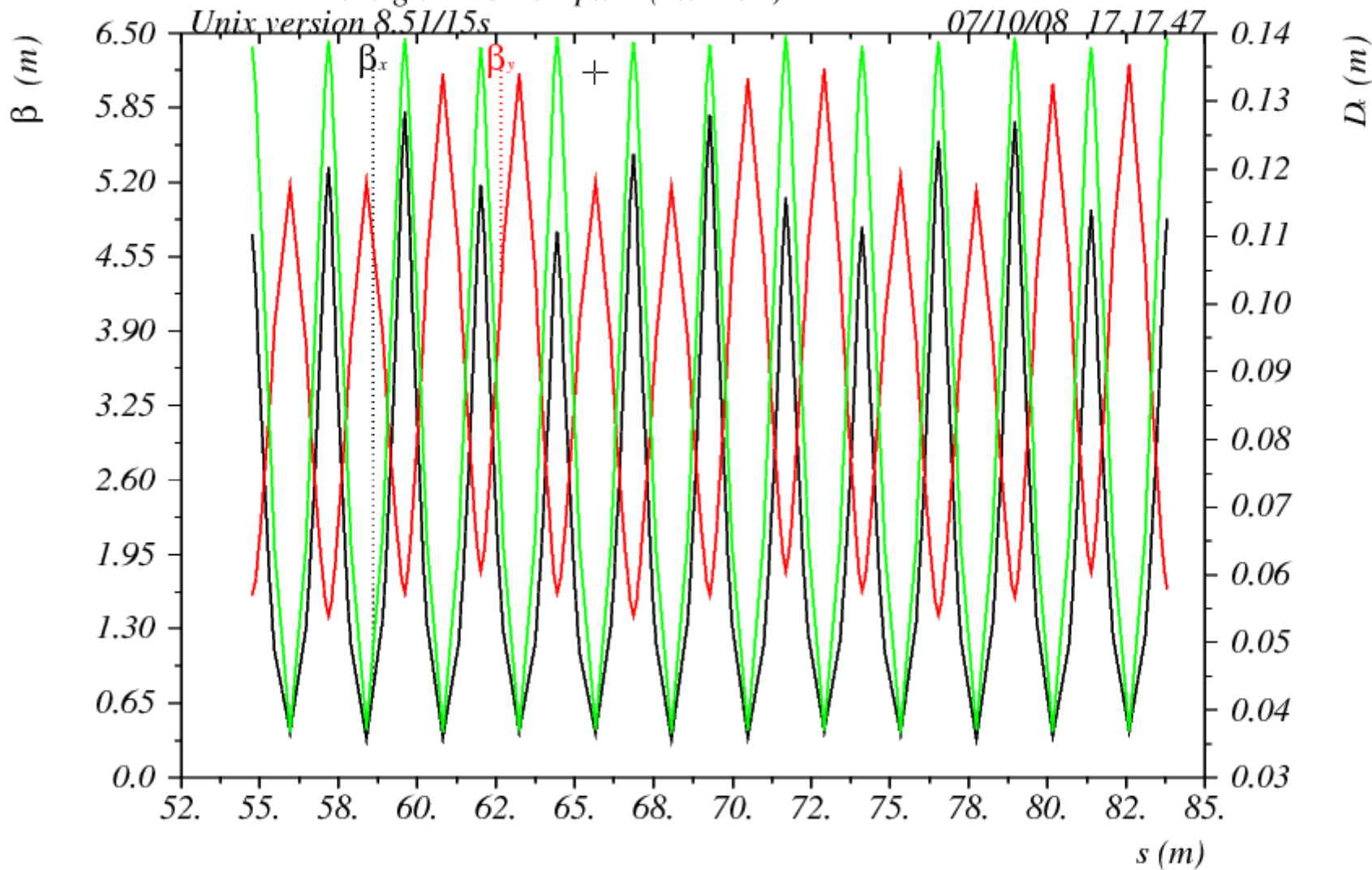




nominal

West Arc
ATF2 DR: drdsn07Dec03 optics (1.3 GeV)
Unix version 8.51/15s

07/10/08 17:17:47



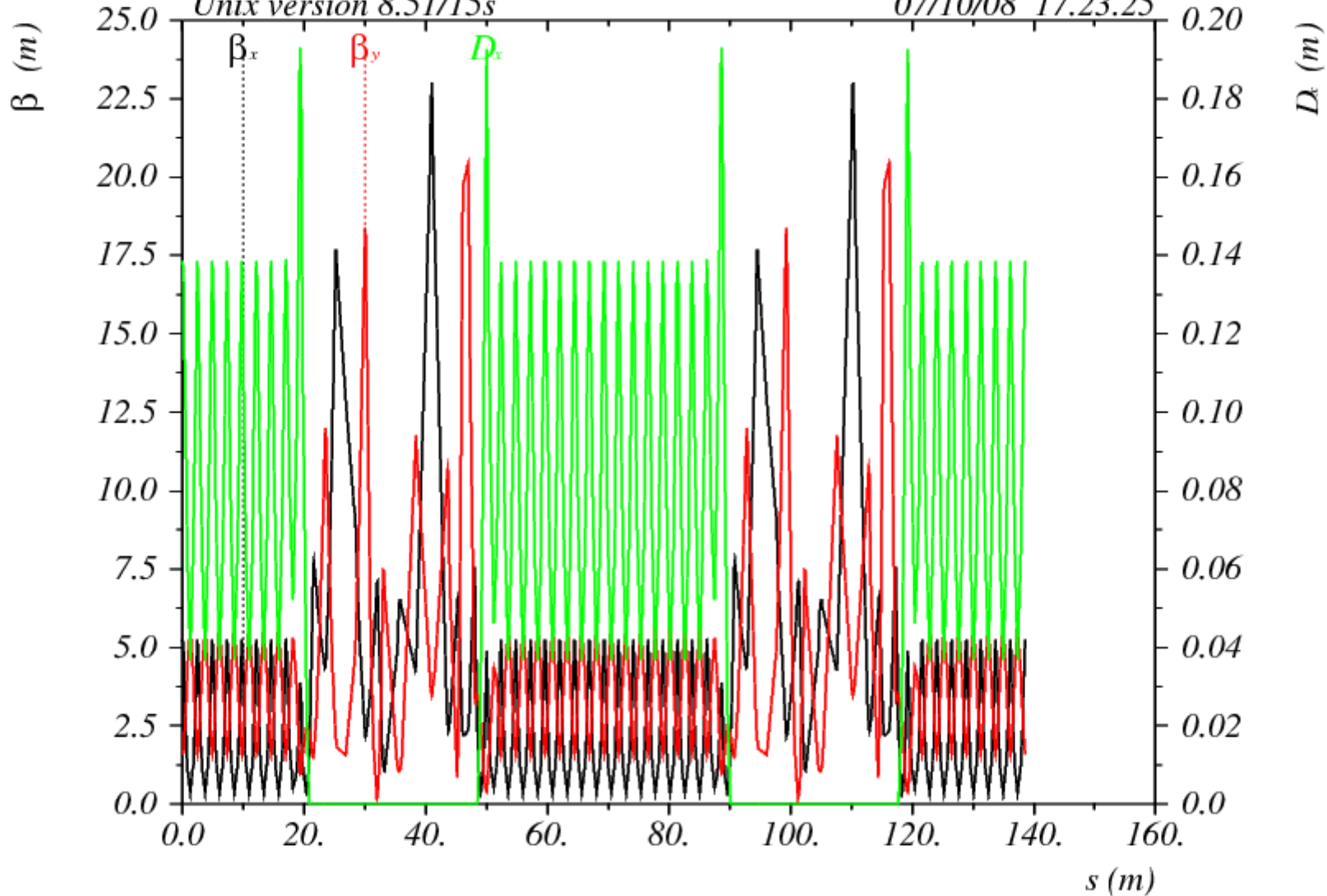


nominal
periodic FOBO

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.23.25



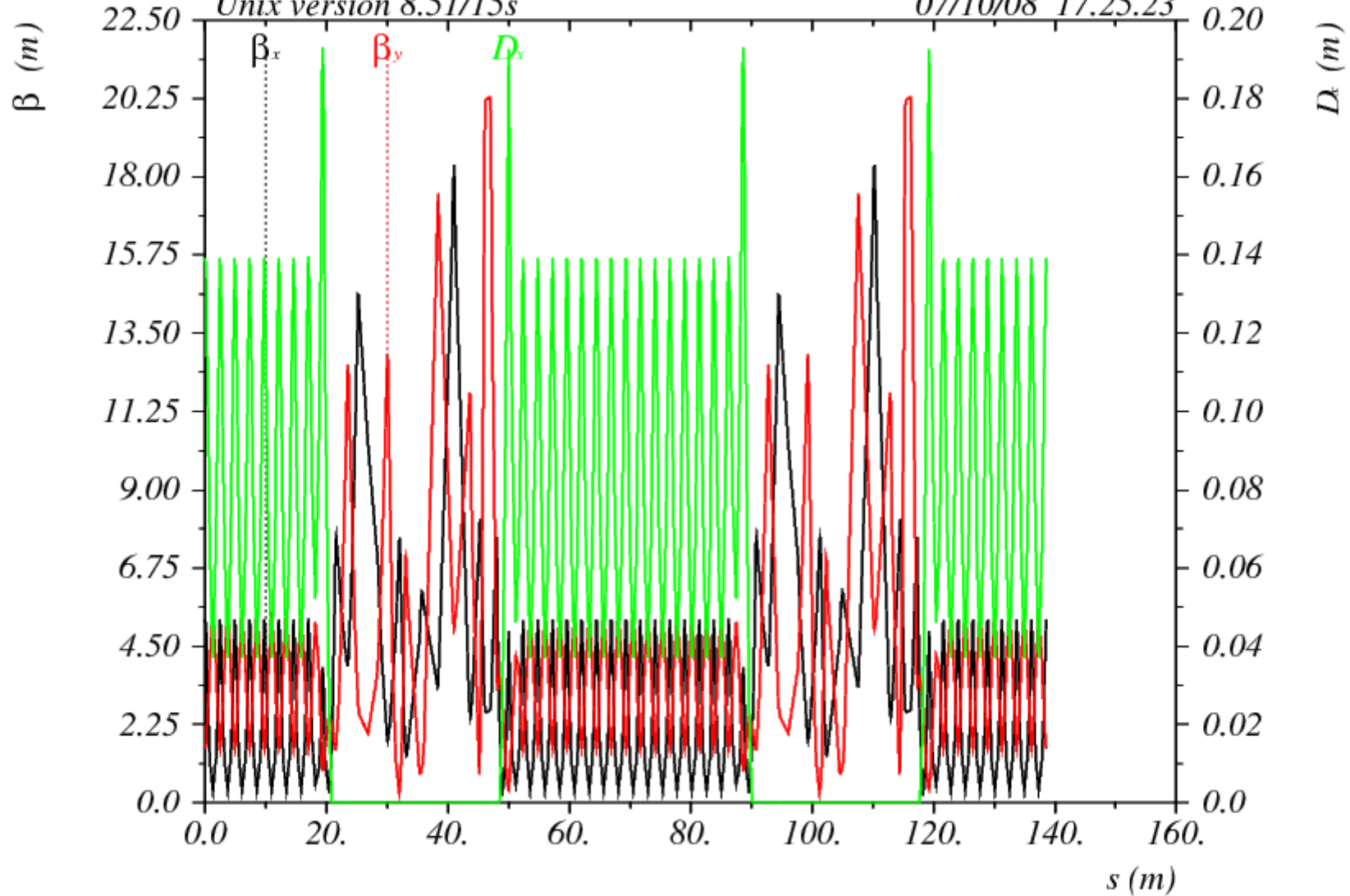


QM7R 90%

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.25.23



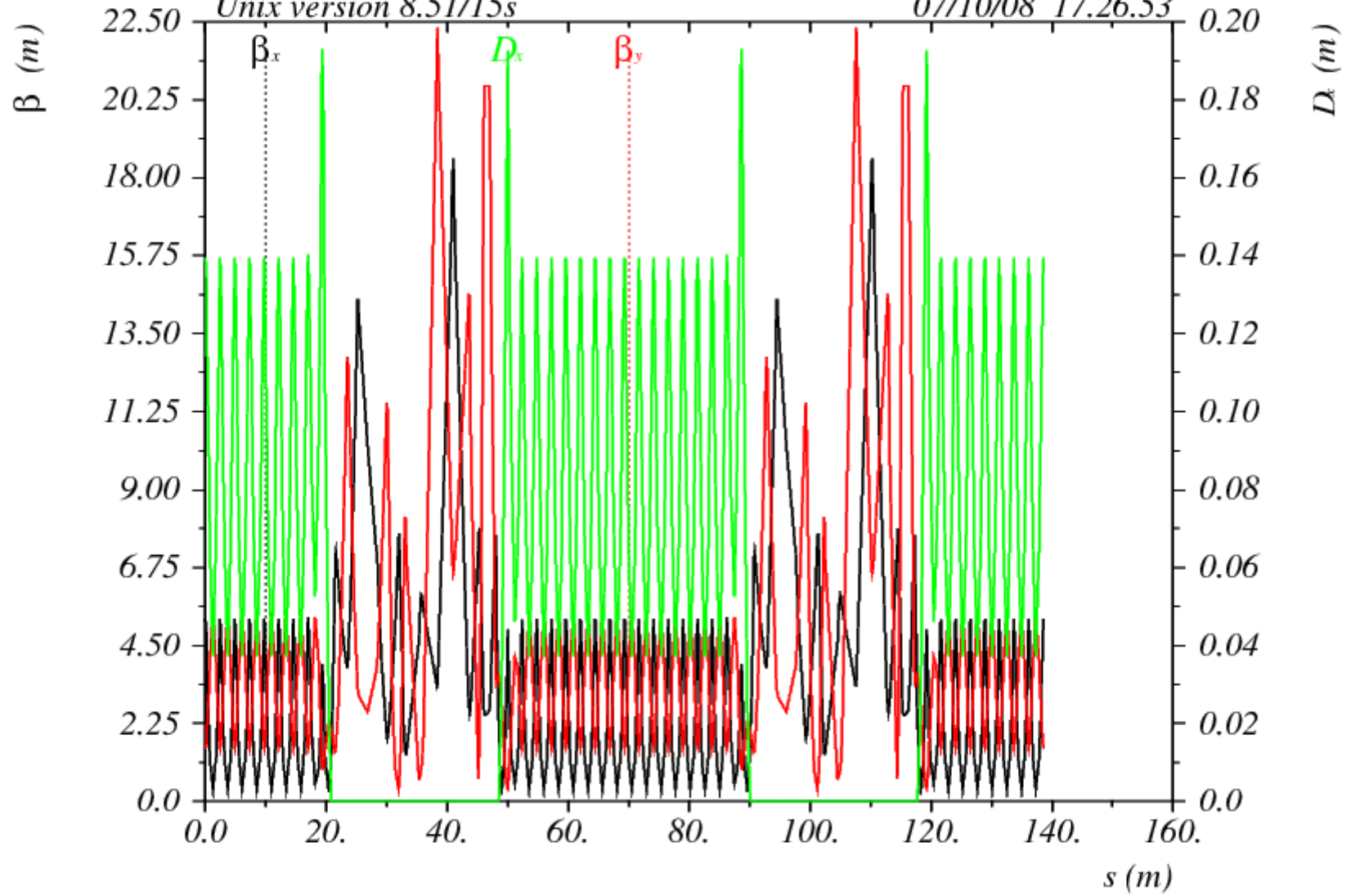


QM7R 80%

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.26.53



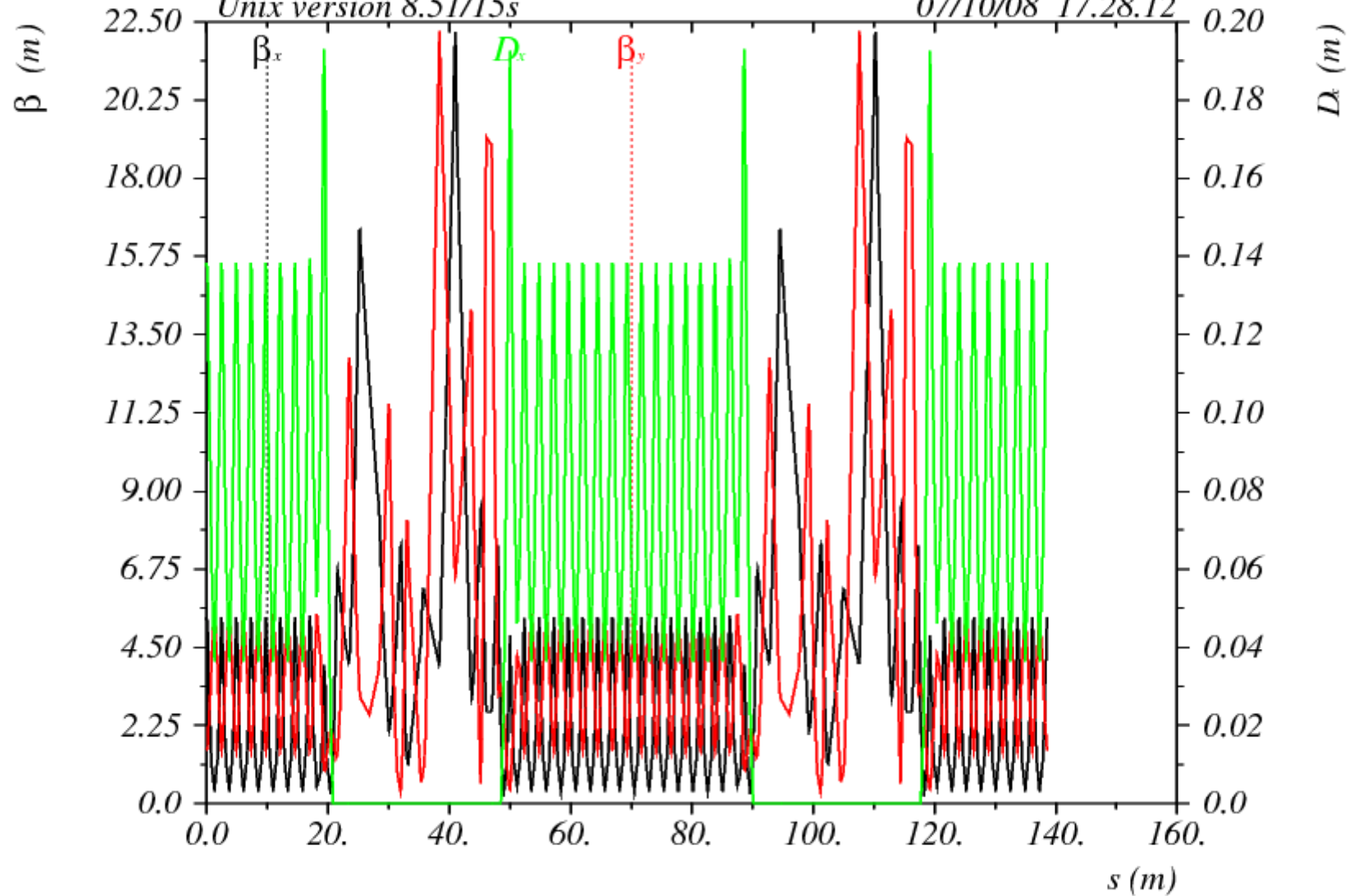


QM7R 70%

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.28.12



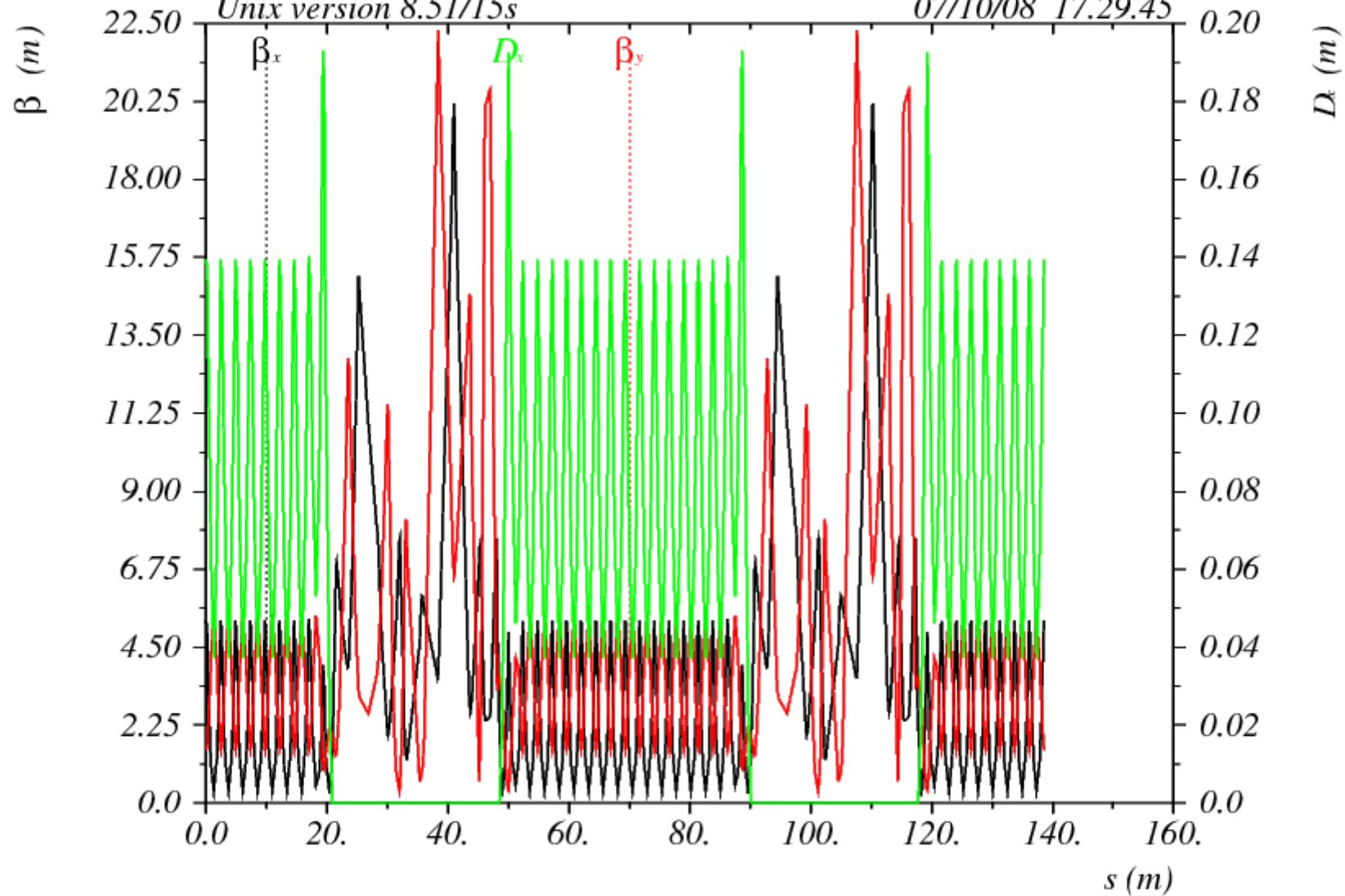


QM7R 60%

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.29.45



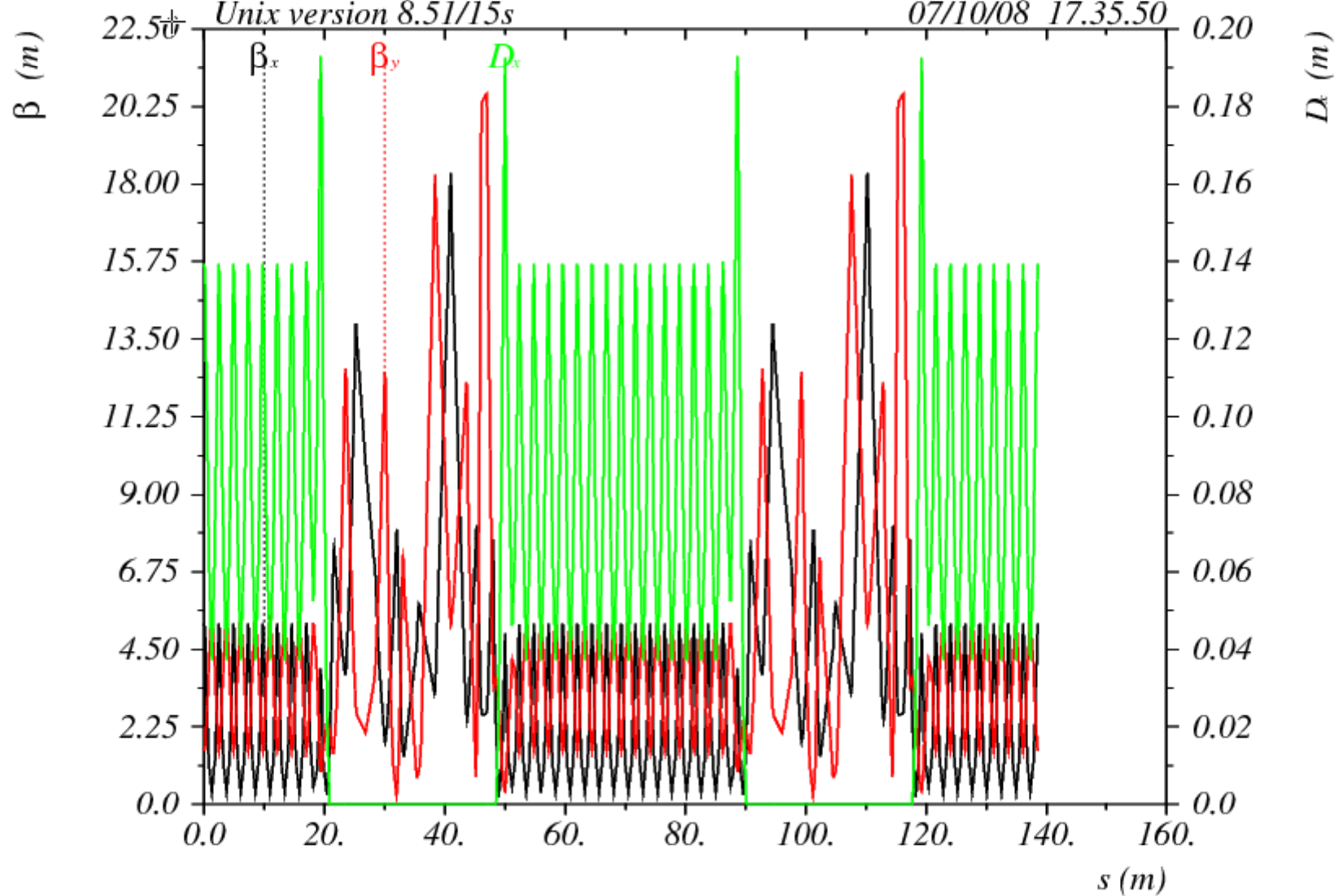


QM7R 50%

ATF2 DR: drdsgn07Dec03 optics (1.3 GeV)

Unix version 8.51/15s

07/10/08 17.35.50



QM7R error (%)	0	0*	-10	-20
BX @ IEX	6.54290	6.820297395009	6.629731946011	6.29030440822
AX @ IEX	0.99638	1.102986137543	1.21294254058	1.102926113338
BY @ IEX	3.23785	2.942307635842	3.018115240507	2.95416721356
AY @ IEX	-1.9183	-1.911243365101	-2.011517468612	-2.048588403813
BX @ QM7R	17.36667099719	17.36667099719	14.373617469421	14.252836314251
AX @ QM7R	-5.446335947628	-5.446335947628	-4.351839126073	-4.329242077723
BY @ QM7R	2.207961932253	2.207961932253	2.885372271188	3.36784313662
AY @ QM7R	1.677267926552	1.677267926552	1.831249679062	1.887854644562
KLQF2R	1.637698862961	1.641827634059	1.642130049823	1.644740432134
KLQF1R	0.028695626596	0.029655754423	0.015544591566	0.912480481049E-2
KLQM1R	1.546072782732	1.510729190384	1.499361975921	1.44764458298
KLQM2R	0.0	0.080498555392	0.10711911585	0.204653081108
KLQM3R	-0.243073891971	-0.306720366748	-0.337025989608	-0.406878393683
KLQM4R	1.998255823783	2.018524709058	2.026718694924	2.045747443827
KLQM5R	1.00601137455	1.015751766524	1.037561300661	1.036316344732
KLQM6R	-0.71174	-0.728688211276	-0.697426102313	-0.681802740011
KLQM14	0.502780097565	0.492409412102	0.487824097137	0.481333803382
KLQM15	-1.11677158547	-1.081866885168	-1.035689646538	-0.978357157982
KLQM16	0.974530366481	0.96764410326	0.990884708086	0.983172974369
KLQM17	-0.981826491583	-1.004879370917	-1.034080367384	-1.044610301068
KLQM18	-0.645922376697	-0.626626332046	-0.600244528506	-0.618241341029
KLQM19	1.540744011759	1.498037003549	1.476878150087	1.480154155227
KLQM22	-0.305011081003	-0.280315178258	-0.303422130458	-0.305091153315
KLQM23	1.683192756426	1.678755016271	1.684003181392	1.684841052098
KLQF1X	1.07347314146	1.07347314146	1.074525158029	1.075595399678
KLQD2X	-0.941217293288	-0.941217293288	-0.941133792686	-0.940885595893
KLQF3X	0.669119133753	0.669119133753	0.674346252199	0.679415123454
KLQF4X	0.680185709967	0.680185709967	0.683732629324	0.686267608535
KLQD5X	-0.926993177043	-0.926993177043	-0.923888410203	-0.920816726023
KLQF6X	1.12835182	1.12835182	1.123981473299	1.119704635834
KLQF7X	0.38978022796	0.38978022796	0.343453883348	0.295348579534
KLQD8X	-0.589666760602	-0.589666760602	-0.588621068985	-0.581946965864
KLQF9X	0.735362498617	0.735362498617	0.724273895439	0.731304360269

Notes:

- QM7R error = 0 : DR optics = drdsgn07Dec03 ; EXT optics = v4.0
- QM7R error = 0* : rematch with periodic FOBO cells
- Twiss at QM7R : values quoted at entrance to QM7R

QM7R error (%)	0*	-30	-40	-50
BX @ IEX	6.820297395009	5.972101408854	6.082953213066	6.445442407004
AX @ IEX	1.102986137543	0.886377641178	1.002307992746	1.21503415874
BY @ IEX	2.942307635842	2.859660405407	2.892325157952	2.967888063242
AY @ IEX	-1.911243365101	-2.040554156598	-2.044281322424	-2.017047921809
BX @ QM7R	17.36667099719	16.22196727772	14.962634346376	13.733081790574
AX @ QM7R	-5.446335947628	-5.082600039533	-4.619726710905	-4.165149528628
BY @ QM7R	2.207961932253	3.357010035959	3.363803778459	2.962600682459
AY @ QM7R	1.677267926552	1.886006345151	1.887511606688	1.843164287252
KLQF2R	1.641827634059	1.647201987299	1.644856026385	1.639565619061
KLQF1R	0.029655754423	0.01067927488	0.010495511421	0.016358938621
KLQM1R	1.510729190384	1.381369698089	1.407633750806	1.472375487968
KLQM2R	0.080498555392	0.316036503489	0.271321473038	0.152848756486
KLQM3R	-0.306720366748	-0.468391535524	-0.443454227929	-0.365074695622
KLQM4R	2.018524709058	2.060833868599	2.054565854134	2.033705730761
KLQM5R	1.015751766524	1.016336311376	1.029513631868	1.044904595842
KLQM6R	-0.728688211276	-0.687489576378	-0.685476748468	-0.69723427478
KLQM14	0.492409412102	0.483033313001	0.482845949916	0.491247792694
KLQM15	-1.081866885168	-0.97663790427	-0.968676582303	-1.022294430798
KLQM16	0.96764410326	0.959526774238	0.964011947993	0.982782633875
KLQM17	-1.004879370917	-1.041376393159	-1.010145075451	-1.009013377553
KLQM18	-0.626626332046	-0.623869493685	-0.660157413428	-0.63371832365
KLQM19	1.498037003549	1.493084161306	1.498835893401	1.490928908267
KLQM22	-0.280315178258	-0.293610178847	-0.302321506591	-0.311237133682
KLQM23	1.678755016271	1.682710001303	1.684243293239	1.685287026948
KLQF1X	1.07347314146	1.076421364126	1.076003934612	1.075593928524
KLQD2X	-0.941217293288	-0.944427959161	-0.947193255722	-0.950023234472
KLQF3X	0.669119133753	0.68461498301	0.688235034083	0.691370308564
KLQF4X	0.680185709967	0.688453983632	0.691450916754	0.694904876959
KLQD5X	-0.926993177043	-0.918899171453	-0.917747030926	-0.919339809251
KLQF6X	1.12835182	1.116415738159	1.114591844734	1.113155618956
KLQF7X	0.38978022796	0.243528194631	0.187753299658	0.122623346179
KLQD8X	-0.589666760602	-0.567041418248	-0.54678085186	-0.510141595643
KLQF9X	0.735362498617	0.751123502252	0.745853469689	0.737508301952

Notes:

- QM7R error = 0* : rematch with periodic FOBO cells
- Twiss at QM7R : values quoted at entrance to QM7R