Lattice functions in the Booster with and without quadrupole correctors.

A. Drozhdin

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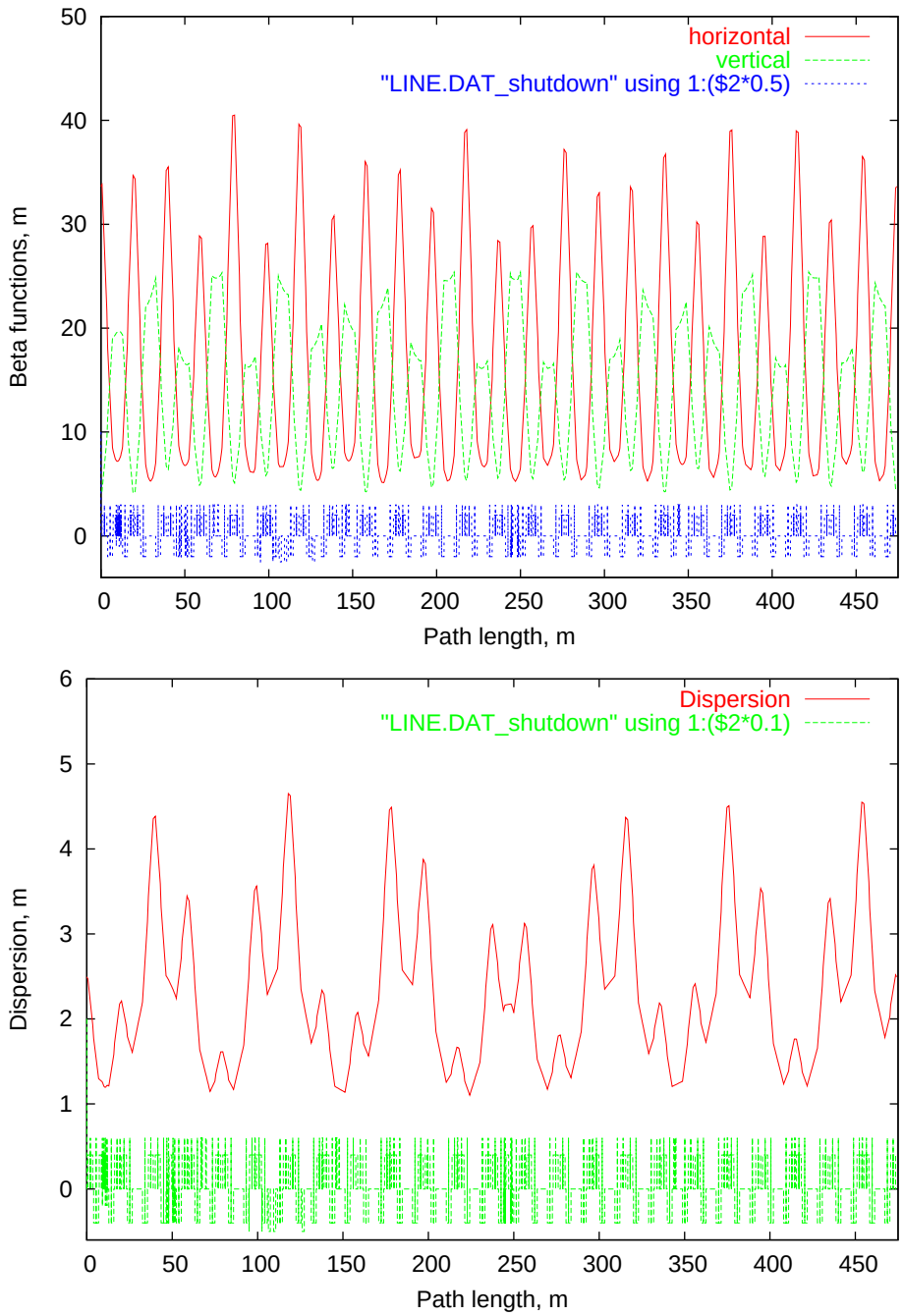

Figure 1: **Booster β-functions and dispersion. Quadrupole correctors are off.**

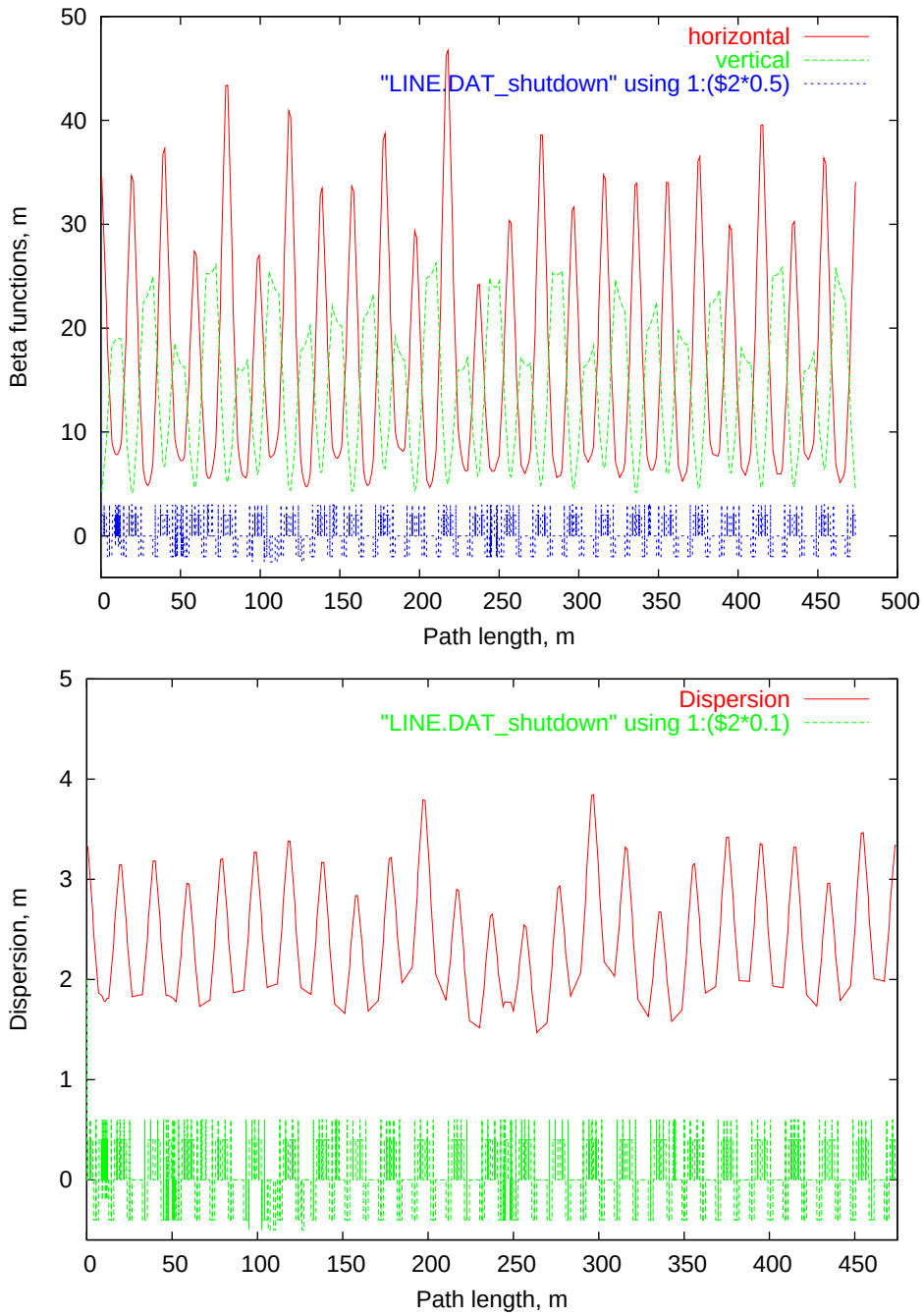

Figure 2: **Booster β-functions and dispersion. Quadrupole correctors are on.**

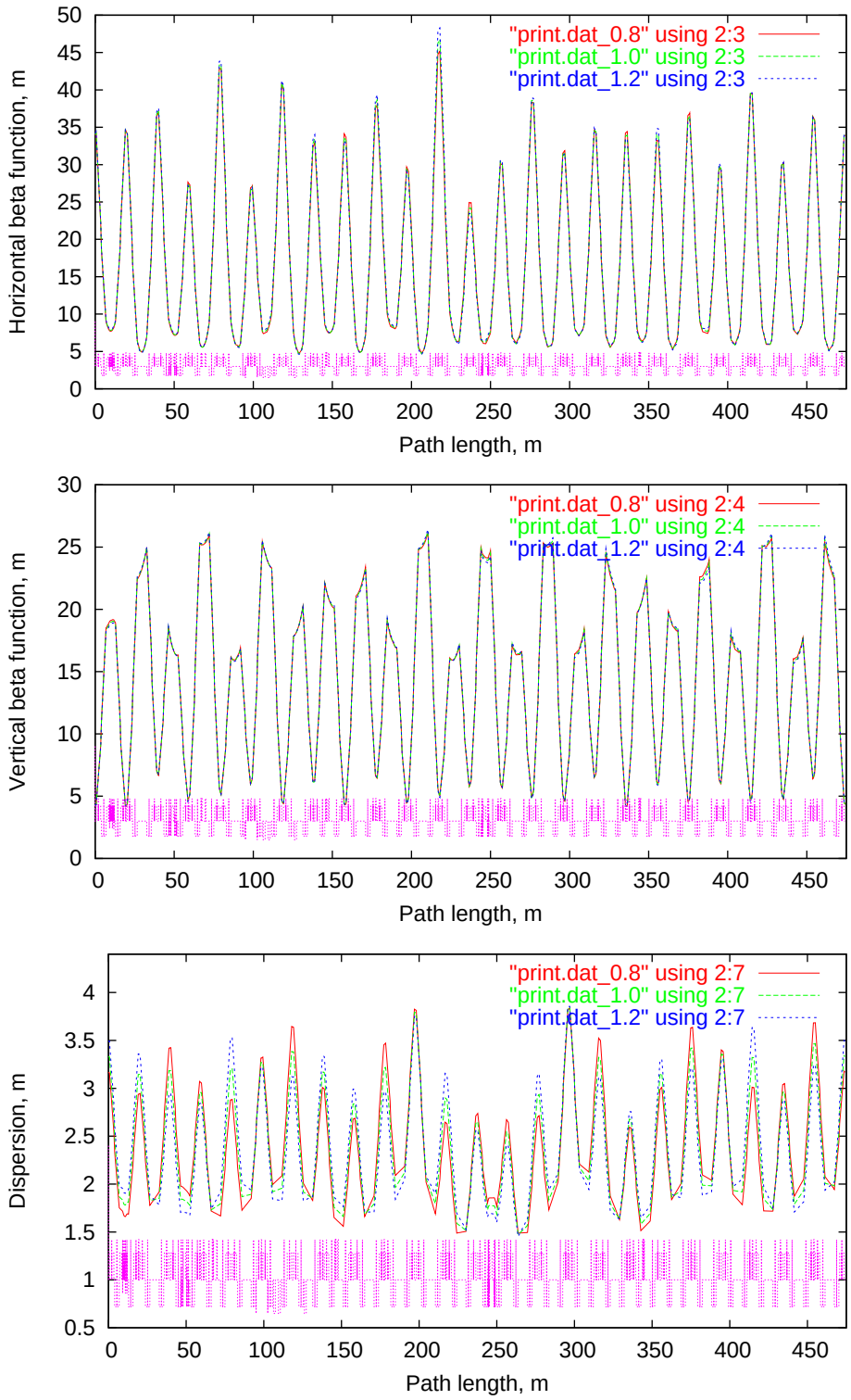

Figure 3: **Booster β-functions and dispersion. Quadrupole correctors are on with** $80\%,\ 100\%,\ 120\%$ **of the strength (quad. correction No.1).**

corrector	correction No.2 current A	correction No.2 current A	correction No.2 with equal tune current A	correction No.2 with equal tune current A	correction No.1 current A	correction No.1 current A	correction Nov. 20, 2003 current A	correction Nov. 20, 2003 current A
iql01	0.000	-	-0.262	-	0.000	-	0.660	-
iqs01	-	0.029	-	0.056	-	0.029	-	0.430
iql02	0.508	-	0.246	-	0.508	-	-0.815	-
iqs02	-	-0.101	-	-0.074	-	-0.101	-	-0.330
iql03	-0.264	-	-0.526	-	-0.264	-	-0.264	-
iqs03	-	-0.217	-	-0.190	-	-0.217	-	-0.517
iql04	-0.148	-	-0.410	-	-0.148	-	0.720	-
iqs04	-	0.211	-	0.238	-	0.211	-	0.513
iql05	0.280	-	0.018	-	0.280	-	0.461	-
iqs05	-	-0.420	-	-0.393	-	-0.420	-	-0.322
iql06	0.240	-	-0.022	-	0.240	-	-0.520	-
iqs06	-	-0.171	-	-0.144	-	-0.171	-	-0.515
iql07	-0.493	-	-0.755	-	-0.478	-	-0.312	-
iqs07	-	0.418	-	0.445	-	0.395	-	0.442
iql08	-0.376	-	-0.638	-	-0.296	-	0.235	-
iqs08	-	-0.036	-	-0.009	-	0.240	-	0.415
iql09	0.343	-	0.081	-	0.265	-	-0.515	-
iqs09	-	-0.126	-	-0.099	-	-0.403	-	-0.270
iql10	0.794	-	0.532	-	-0.135	-	-0.645	-
iqs10	-	0.072	-	0.099	-	0.173	-	0.085
iql11	0.518	-	0.256	-	-0.682	-	0.005	-
iqs11	-	0.313	-	0.340	-	0.308	-	0.445
iql12	0.752	-	0.490	-	-0.301	-	-0.115	-
iqs12	-	-0.500	-	-0.473	-	-0.318	-	-0.180

Table 1: **Booster quadrupole correctors current at injection with quadrupole correction No.1 (before shutdown), No.2, No.2 (with equal tune) and correction from Nov. 20, 2003. Betatron tune in version with quadrupole correction No.2 (with equal tune) is changed to be equal to the tune in version of Nov. 20, 2003. First part.**

corrector	correction No.2 current A	correction No.2 current A	correction No.2 with equal tune current A	correction No.2 with equal tune current A	correction No.1 current A	correction No.1 current A	correction Nov. 20, 2003 current A	correction Nov. 20, 2003 current A
iql13	0.003	-	-0.259	-	0.413	-	-0.105	-
iqs13	-	-0.210	-	-0.183	-	-0.386	-	-0.055
iql14	0.722	-	0.460	-	-0.552	-	-0.395	-
iqs14	-	0.235	-	0.262	-	0.372	-	0.260
iql15	0.195	-	-0.067	-	-0.563	-	-0.350	-
iqs15	-	0.499	-	0.526	-	0.011	-	-0.140
iql16	0.248	-	-0.014	-	0.189	-	0.080	-
iqs16	-	-0.109	-	-0.082	-	-0.322	-	-0.285
iql17	0.366	-	0.104	-	0.256	-	-0.490	-
iqs17	-	0.490	-	0.517	-	0.206	-	0.220
iql18	-0.459	-	-0.721	-	-0.698	-	-0.310	-
iqs18	-	0.378	-	0.405	-	0.624	-	-0.055
iql19	0.758	-	0.496	-	-0.296	-	-0.270	-
iqs19	-	-0.378	-	-0.351	-	-0.247	-	-0.065
iql20	0.538	-	0.276	-	0.445	-	0.350	-
iqs20	-	-0.481	-	-0.454	-	-0.626	-	0.150
iql21	-0.563	-	-0.825	-	-0.370	-	-0.385	-
iqs21	-	0.262	-	0.289	-	0.204	-	0.060
iql22	-0.642	-	-0.904	-	-0.662	-	-0.665	-
iqs22	-	-0.468	-	-0.441	-	-0.336	-	-0.650
iql23	0.061	-	-0.201	-	0.235	-	0.705	-
iqs23	-	-0.205	-	-0.178	-	-0.133	-	0.025
iql24	-0.340	-	-0.602	-	0.497	-	-0.045	-
iqs24	-	-0.202	-	-0.175	-	-0.303	-	0.210

Table 2: **Booster quadrupole correctors current at injection with quadrupole correction No.1 (before shutdown), No.2, No.2 (with equal tune) and correction from Nov. 20, 2003. Betatron tune in version with quadrupole correction No.2 (with equal tune) is changed to be equal to the tune in version of Nov. 20, 2003. Second part.**

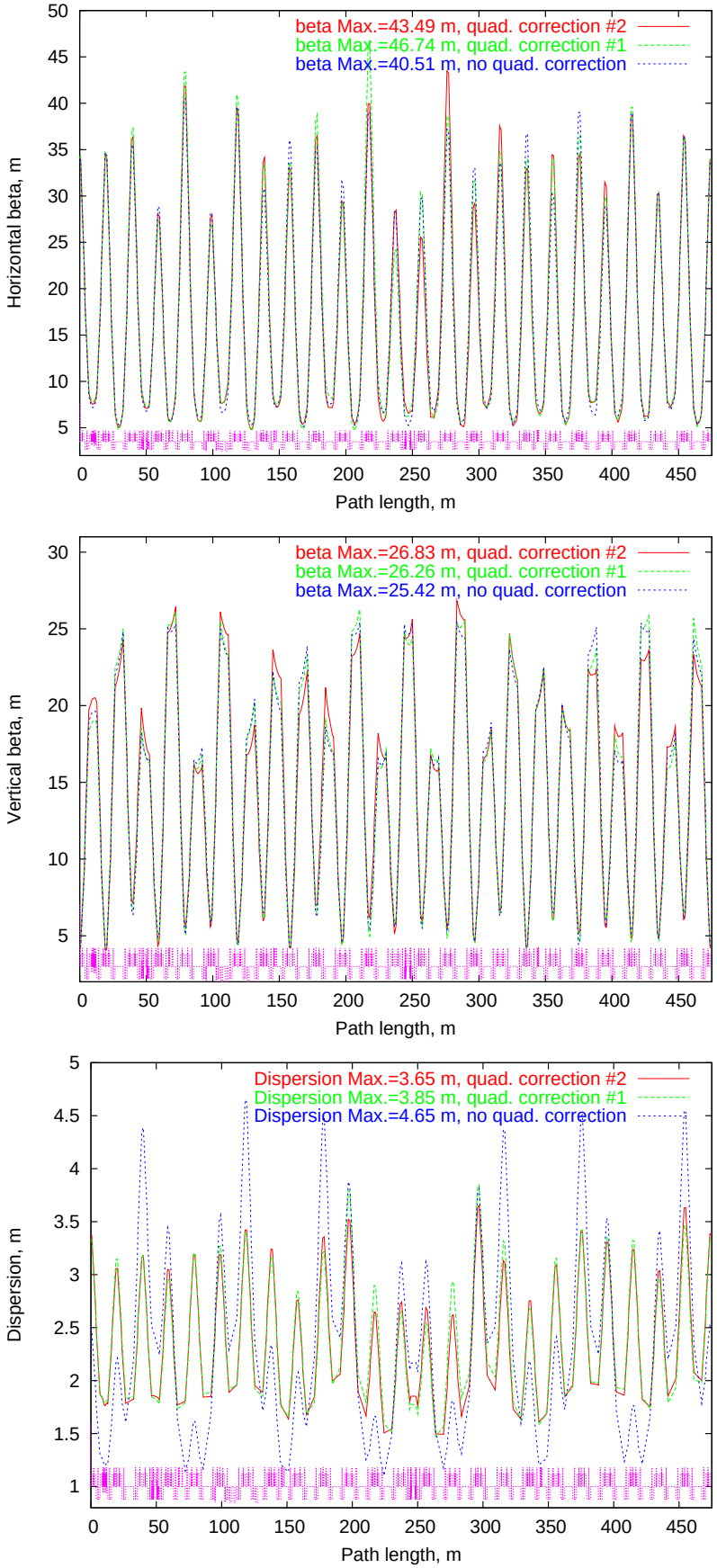

Figure 4: **Booster β-functions and dispersion at injection with different sets of quadrupole correctors (quad. correction No.1, No.2 and without correction).**

	β_x/β_{x_o}	β_y/β_{y_o}	D_x/D_{x_o}
without quad. correction	1.00	1.00	1.00
correction No.1	1.15	1.03	0.83
correction No.2	1.07	1.05	0.78

Table 3: **Maximum of β_x, β_y, and dispersion at injection for different qudrupole correction.**

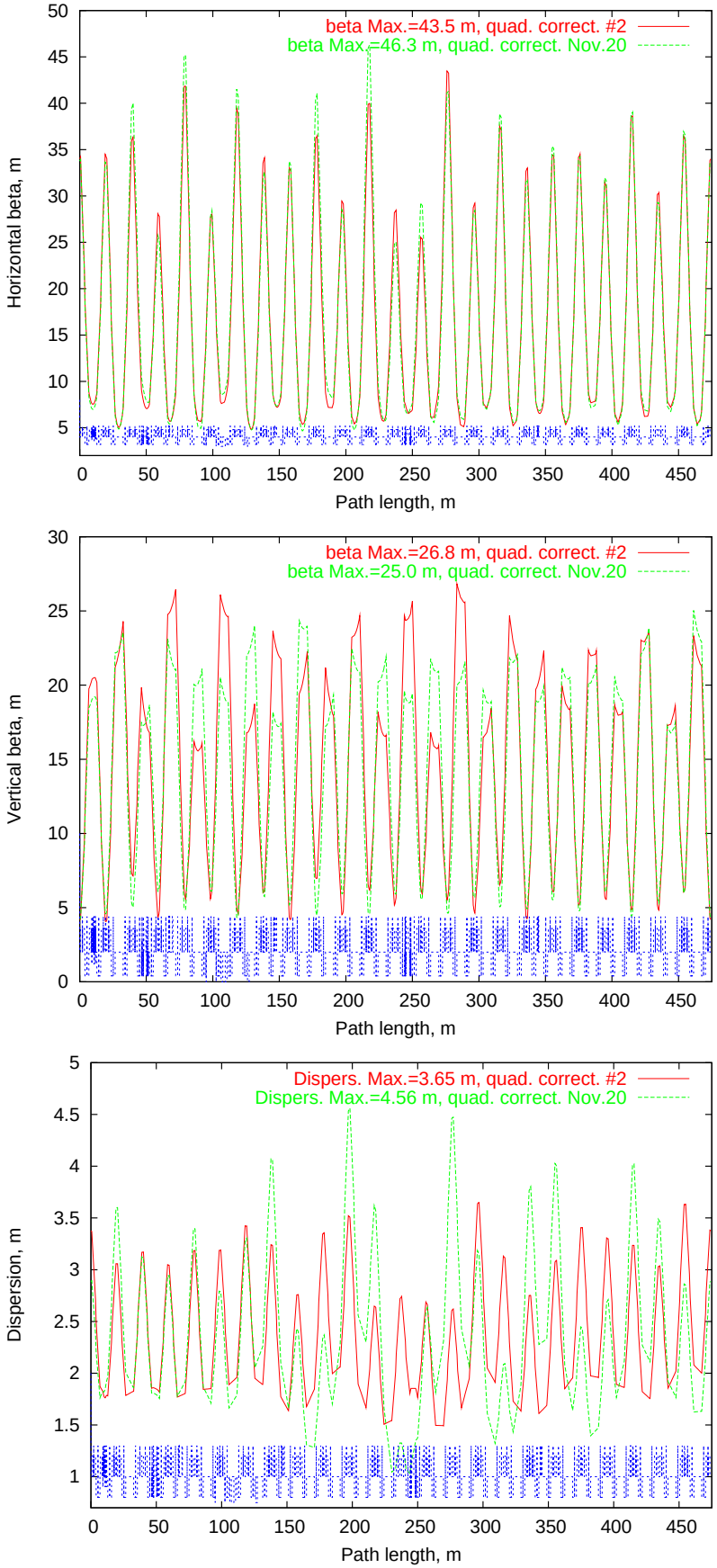

Figure 5: **Booster β-functions and dispersion at injection with quadrupole correction No.2 and correction from Nov. 20, 2003.**

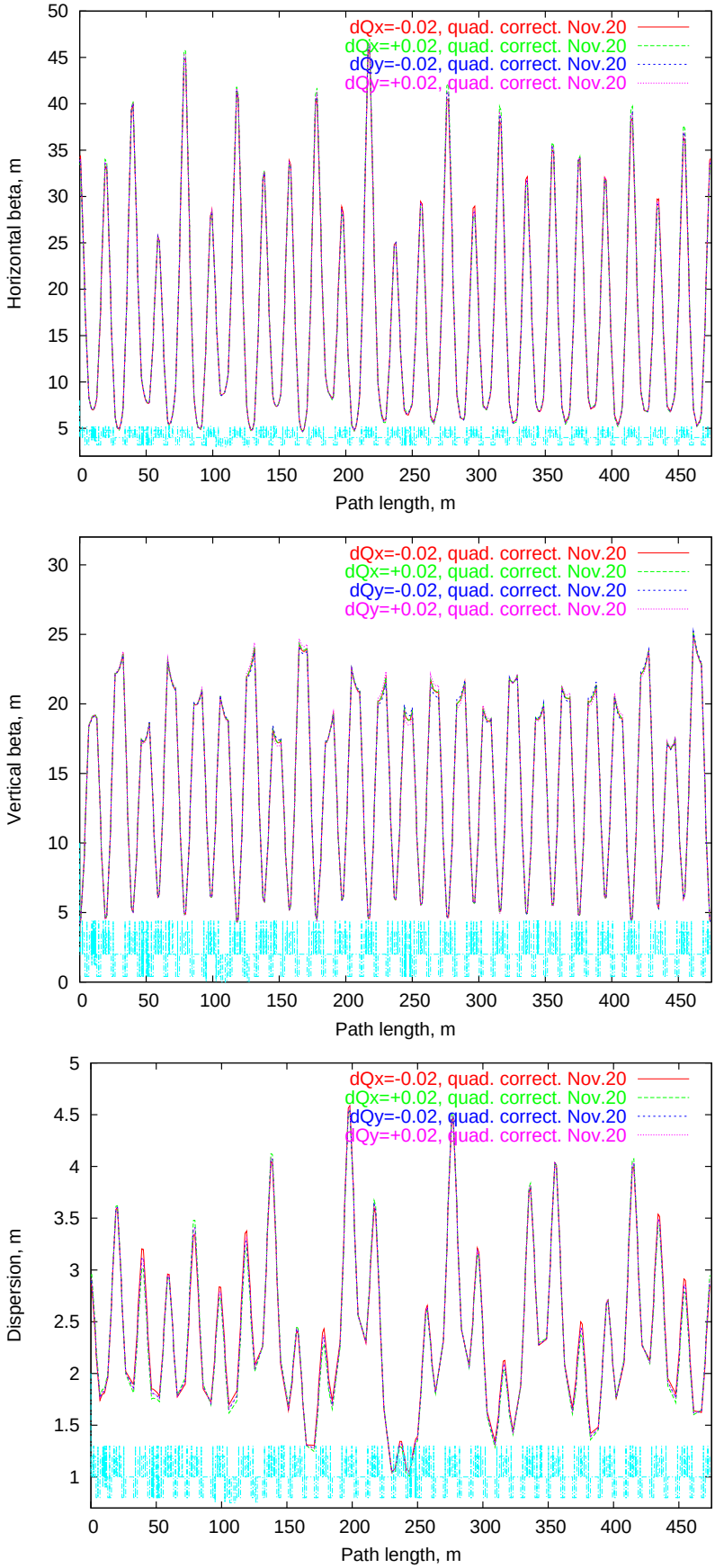

Figure 6: **Booster β-functions and dispersion at injection for tune $\nu_x = \nu_{x_o} \pm 0.02$ and $\nu_y = \nu_{y_o} \pm 0.02$ with quadrupole correction from Nov. 20, 2003. Current at all quadrupole correctors of $\Delta I_{long} = -0.0062\ A$ and $\Delta I_{short} = +0.023422\ A$ change horizontal tune by $\Delta\nu_x = +0.01$, current at all quadrupole correctors of $\Delta I_{long} = -0.040673\ A$ and $\Delta I_{short} = +0.008433\ A$ change vertical tune by $\Delta\nu_y = +0.01$**

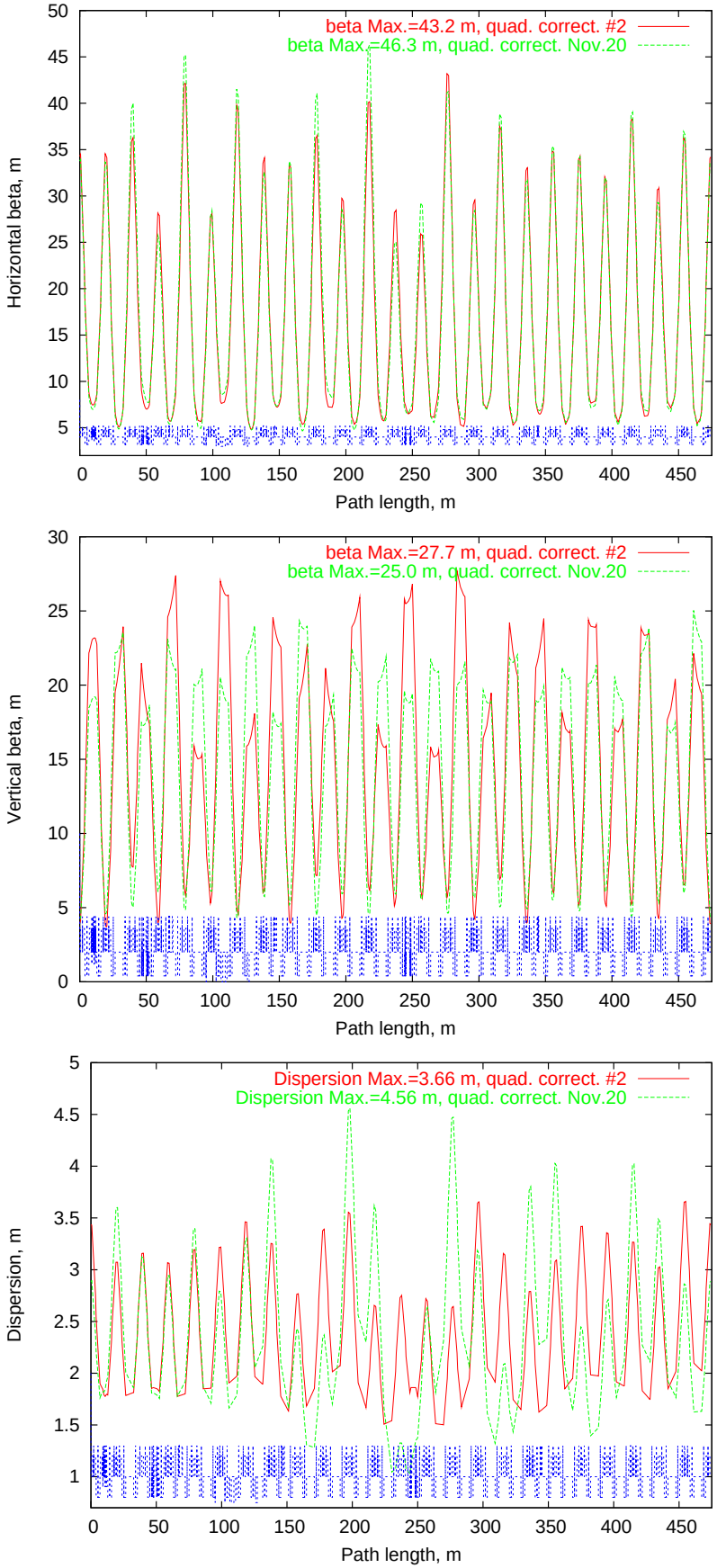

Figure 7: **Booster β-functions and dispersion at injection with quadrupole correction No.2 and correction from Nov. 20, 2003. Betatron tune in version with quadrupole correction No.2 is changed to be equal to the tune in version of Nov. 20, 2003.**