QM7R Vertical Bump Study

March 14, 2008

Observed effects in Damping Ring of vertical orbit bump at QM7R.1

1. Check the effect of the bump in the DR.

Status of the machine: ...SET08MAR14_1114.DAT

Bump coeficients:
ZV9R=1.92889
ZV100R=-1.56217
ZV10R=-1.22152
Closing the bump in the extraction line:
ZV1X=-1.04553
ZV2X=1.52836

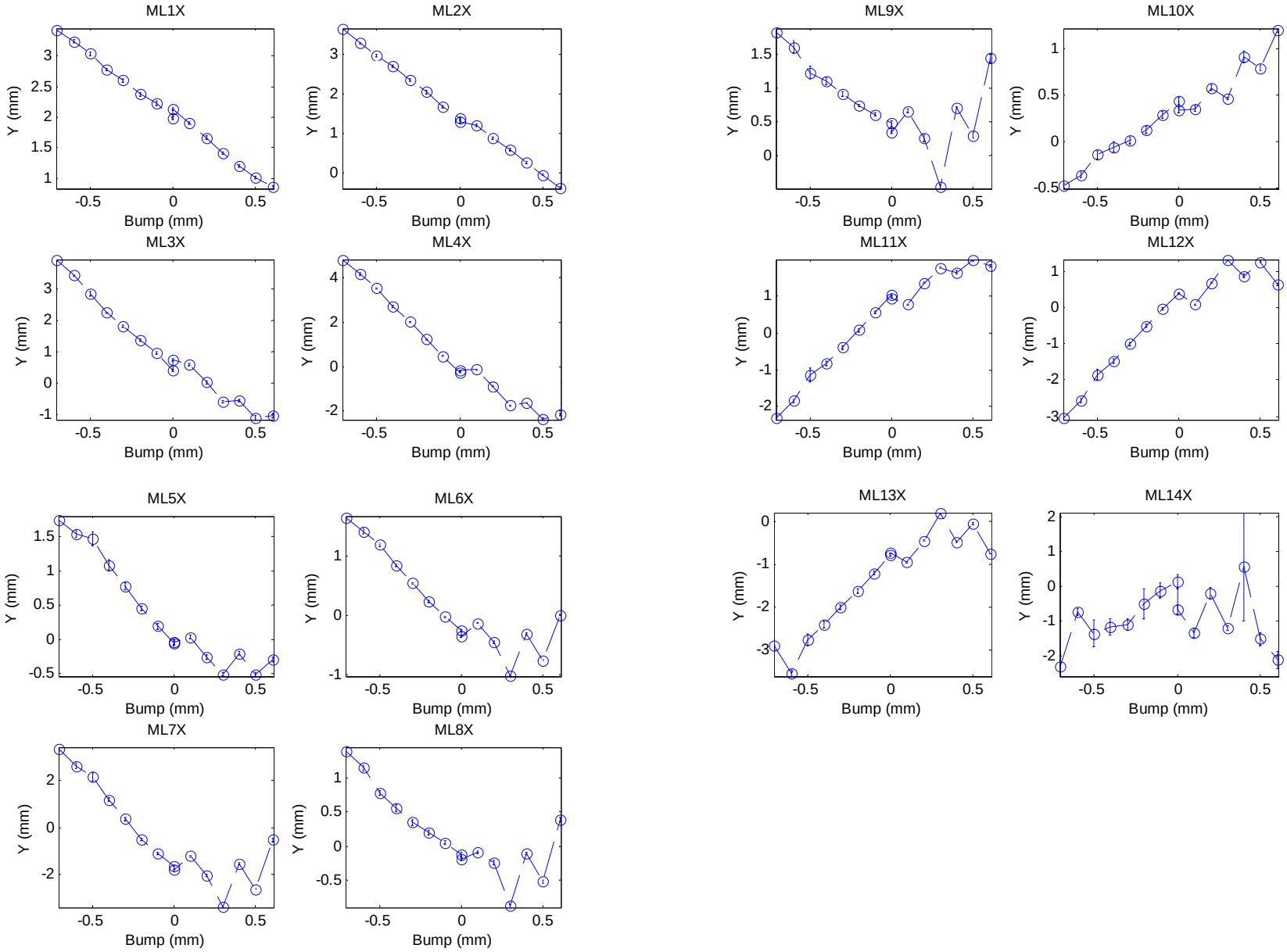
Bump (mm)	Saved orbit file	
+0.1	08MAR14_122323	
+0.2	08MAR14_122933	
+0.3	08MAR14_123510	
+0.4	08MAR14_124011	
+0.5	08MAR14_124504	
+0.6	08MAR14_125003	
0.0	08MAR14_130436	
-0.1	08MAR14_130540	
-0.2	08MAR14_131102	
-0.3	08MAR14_131646	
-0.4	08MAR14_132113	
-0.5	08MAR14_132647	
-0.6	08MAR14_135426	(corrected ... M. Woodley)
-0.7	08MAR14_140211	
Go to positive bump again:		
0.0	08MAR14_140656	

Save status of the machie:
SET08MAR14_1408.DAT

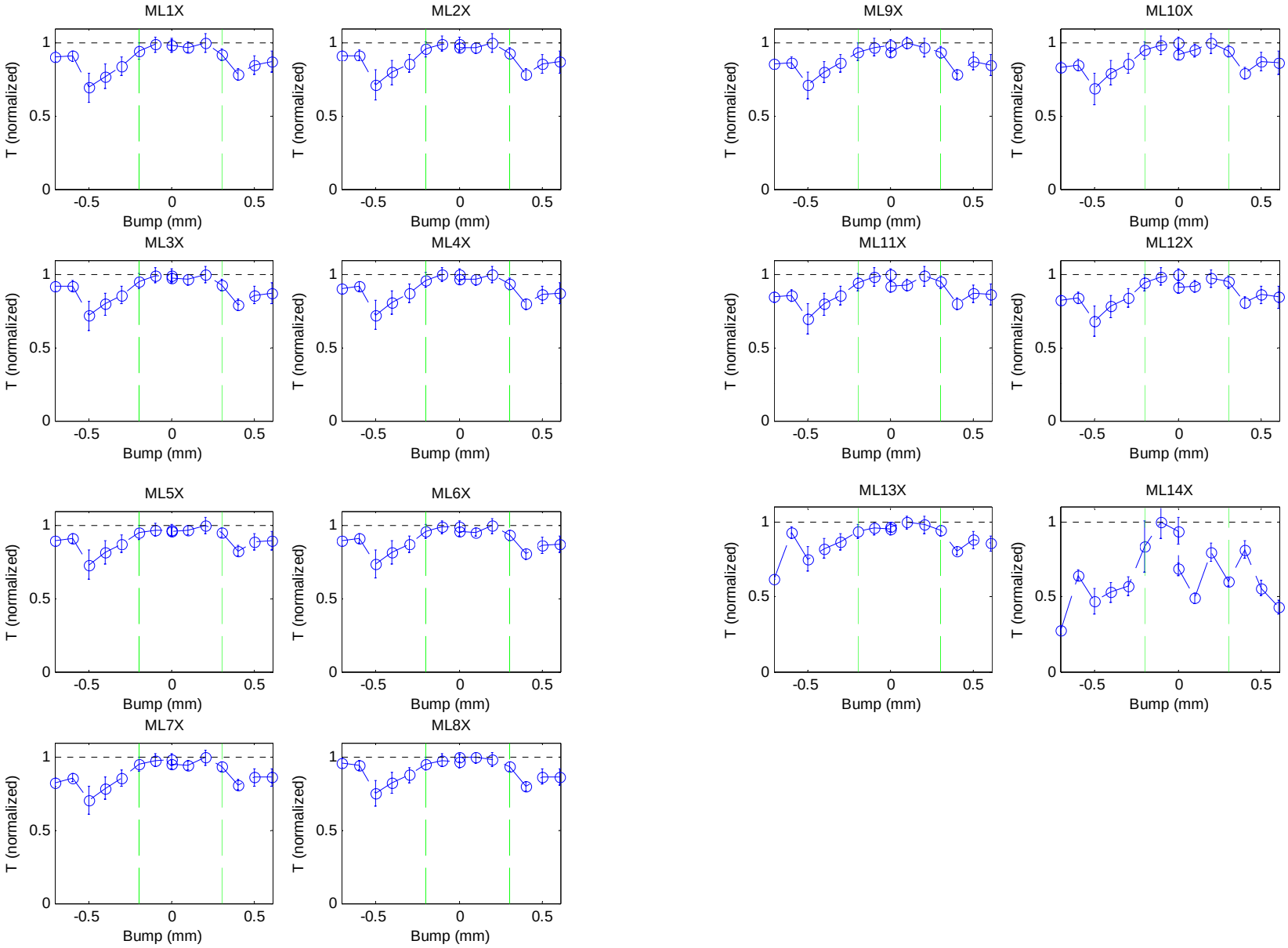
Intensity, bema size and tunes saved in the file:
VLOG$SRMON:LOG_TBTXSR080314.vtab

from: http://www.slac.stanford.edu/~mdw/ATF/BeamStudies/20080314/ShiftReportAlabau.doc

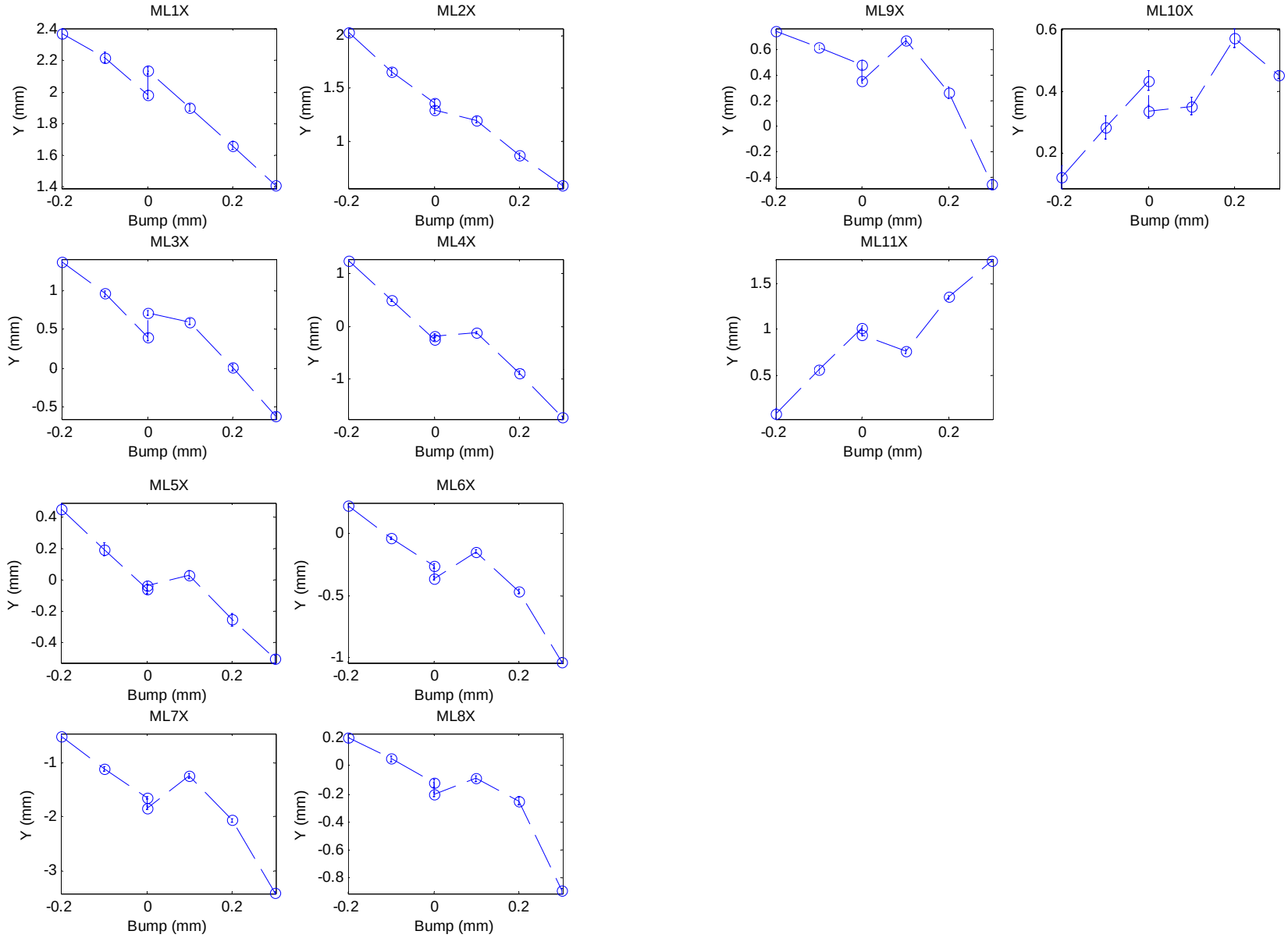
EXT BPMs vs QM7R Vertical Bump



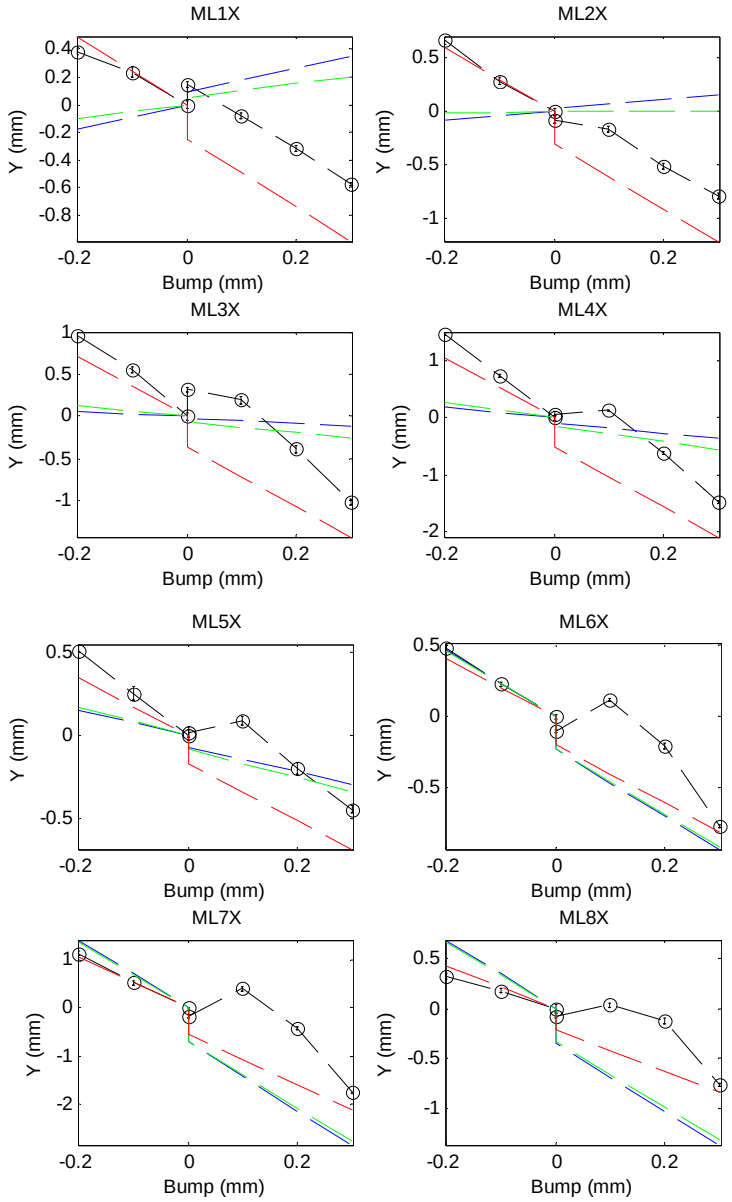
EXT BPMs vs QM7R Vertical Bump: TMIT

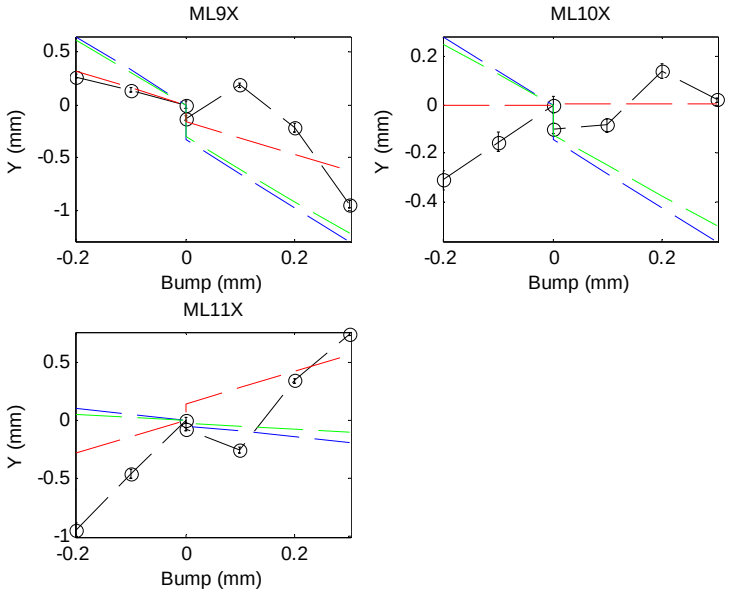


EXT BPMs (1-11) vs QM7R Vertical Bump (>90% TMIT values)



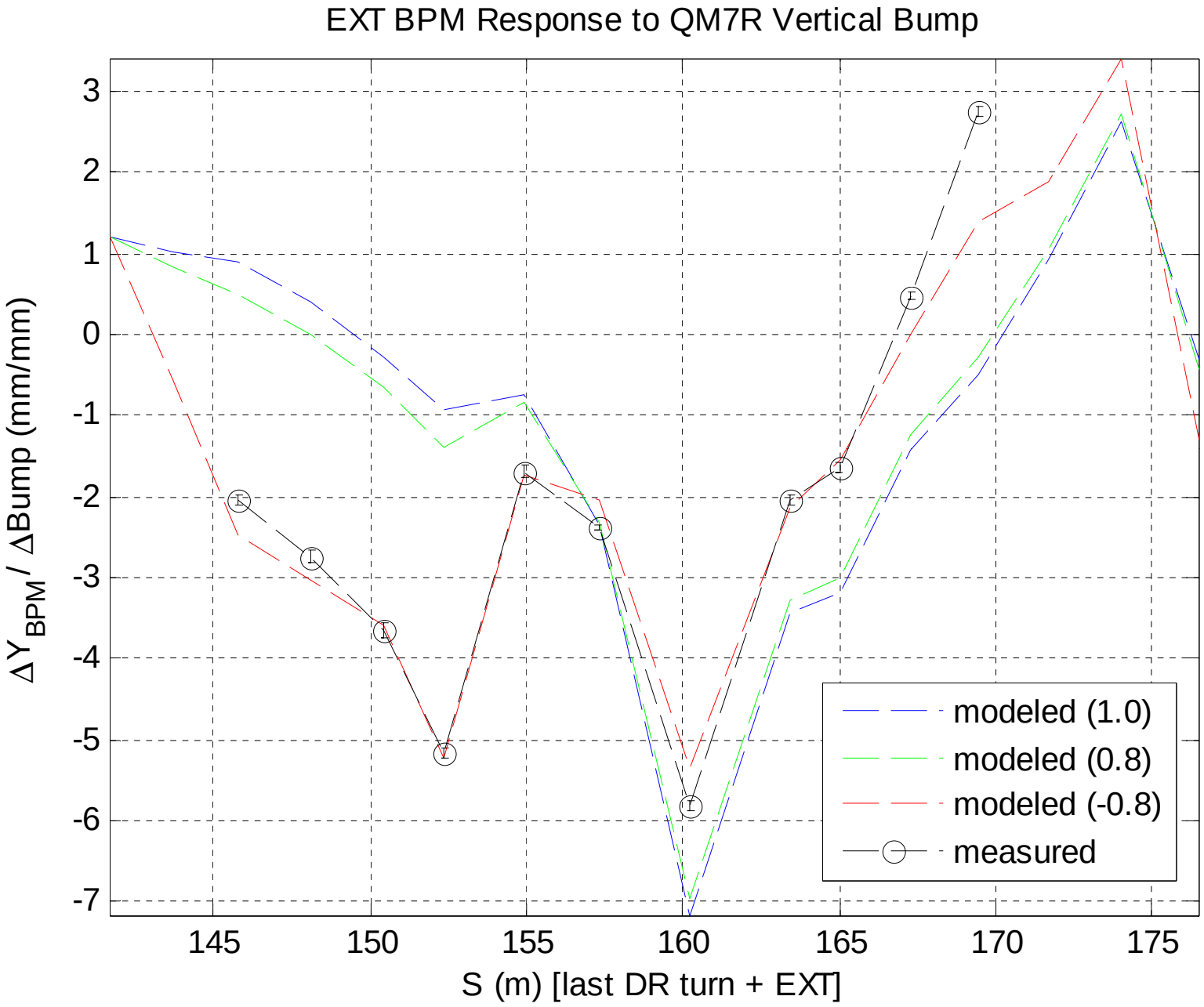
EXT BPMs (1-11) vs QM7R Vertical Bump (>90% TMIT values)





dashed lines are model response:

- blue : QM7R fudge = 1.0
- green : QM7R fudge = 0.8
- red : QM7R fudge = -0.8 (!)


EXT BPM Response to QM7R Vertical Bump
ΔY BPM / ΔBump (mm/mm)
S (m) [last DR turn + EXT]
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
145
150
155
160
165
170
175
modeled (1.0)
modeled (0.8)
modeled (-0.8)
measured

Conclusions

- orbits were measured with monitor set up for DR turn 500000 … timing of EXT BPMs?
- DR/EXT BPM coordinate systems?
- polarity of QM7R.1? … no way!
- repeat measurement with monitor set for EXT orbit measurement

Coordinate System

- DR and EXT BPM coordinate systems both define +Y to be DOWN (I've been told)
- verified (with flippy-magnet) that all vertical correctors in the area of extraction bend e- beam DOWN when positive current is applied
- MAD model predictions should match observations …