

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 coefficients:

ZV9R=1.92889

ZV100R=-1.56217

ZV10R=-1.22152

Closing the bump in the extraction line:

ZV1X=-1.04553

ZV2X=1.52836

Bump (mm)

+0.1

+0.2

+0.3

+0.4

+0.5

+0.6

0.0

-0.1

-0.2

-0.3

-0.4

-0.5

-0.6

-0.7

Go to positive bump again:

0.0

Saved orbit file

08MAR14_122323

08MAR14_122933

08MAR14_123510

08MAR14_124011

08MAR14_124504

08MAR14_125003

08MAR14_130436

08MAR14_130540

08MAR14_131102

08MAR14_131646

08MAR14_132113

08MAR14_132647

08MAR14_135426 (corrected ... M. Woodley)

08MAR14_140211

08MAR14_140656

Save status of the machine:

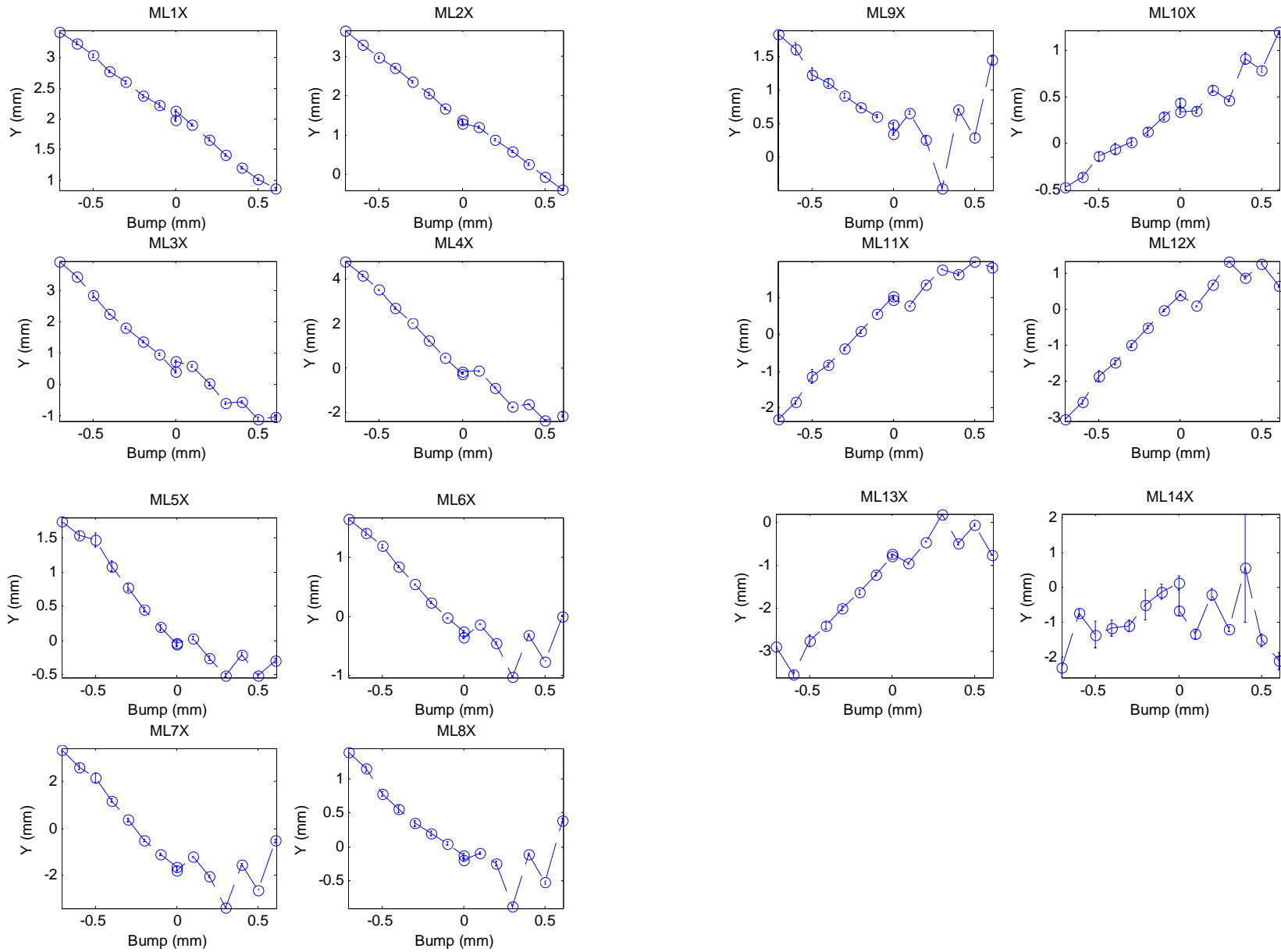
SET08MAR14_1408.DAT

Intensity, beam size and tunes saved in the file:

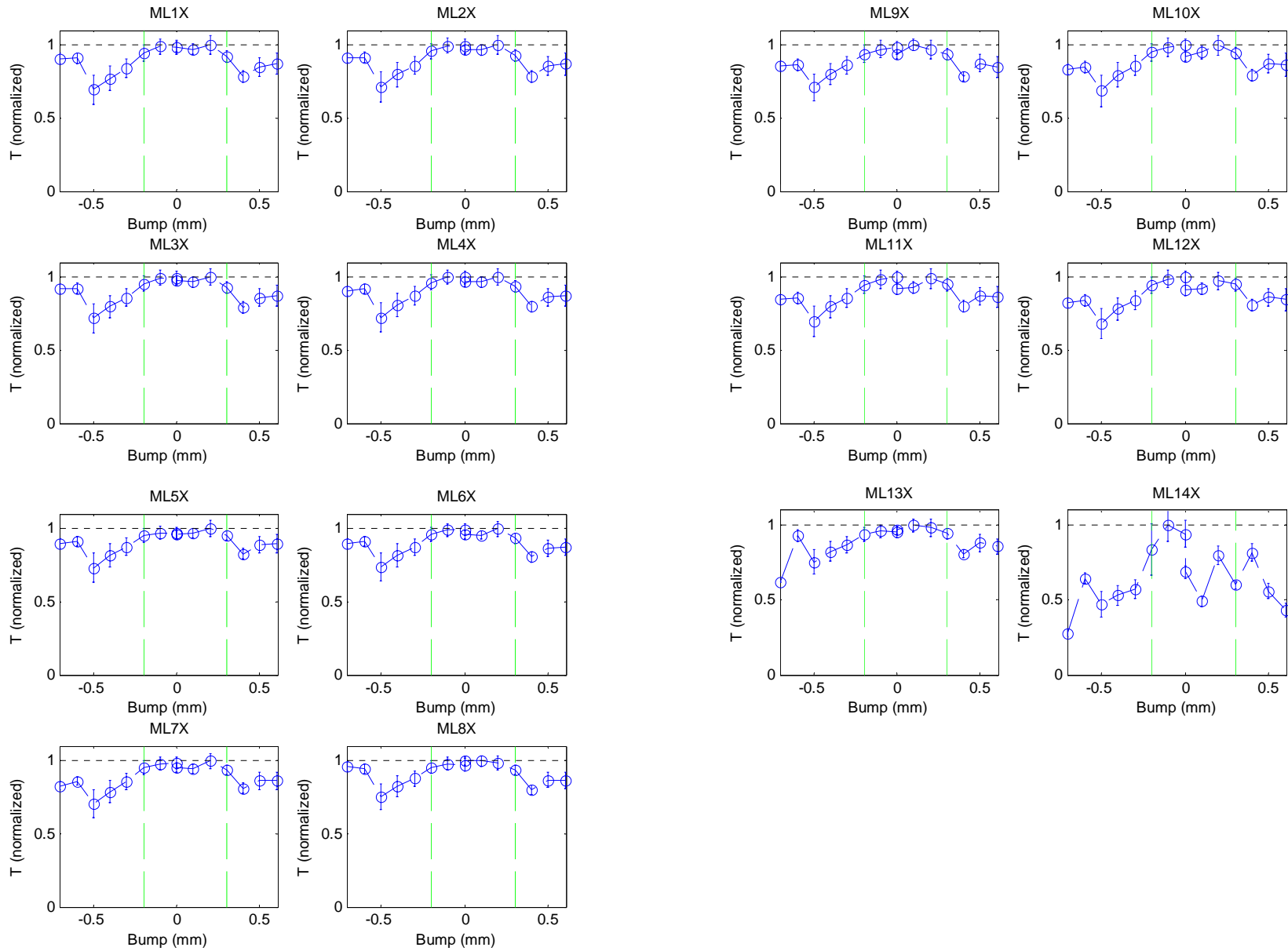
VLOG\$SRMON:LOG_TBTXSR080314.vtab

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

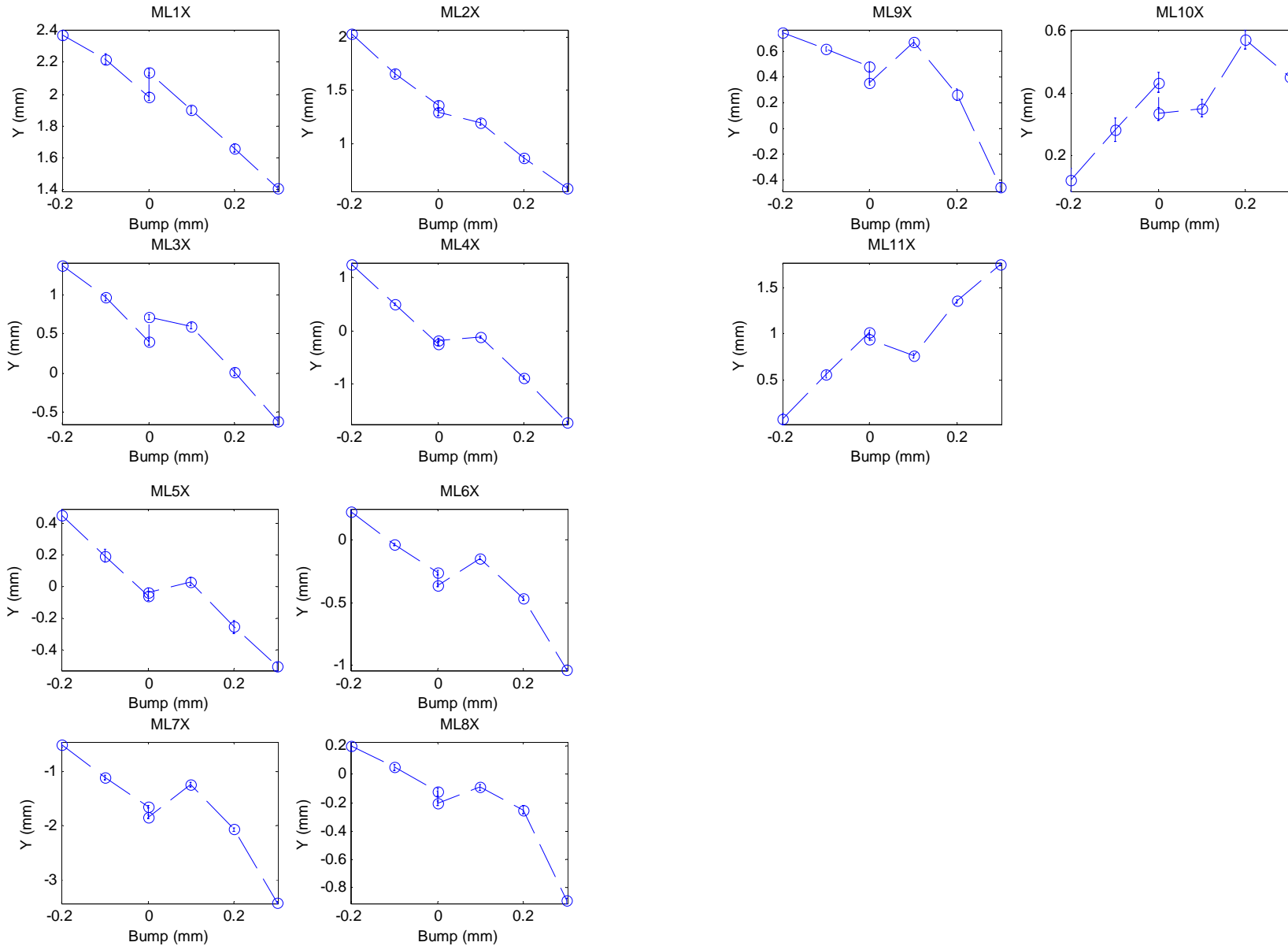
EXT BPMs vs QM7R Vertical Bump



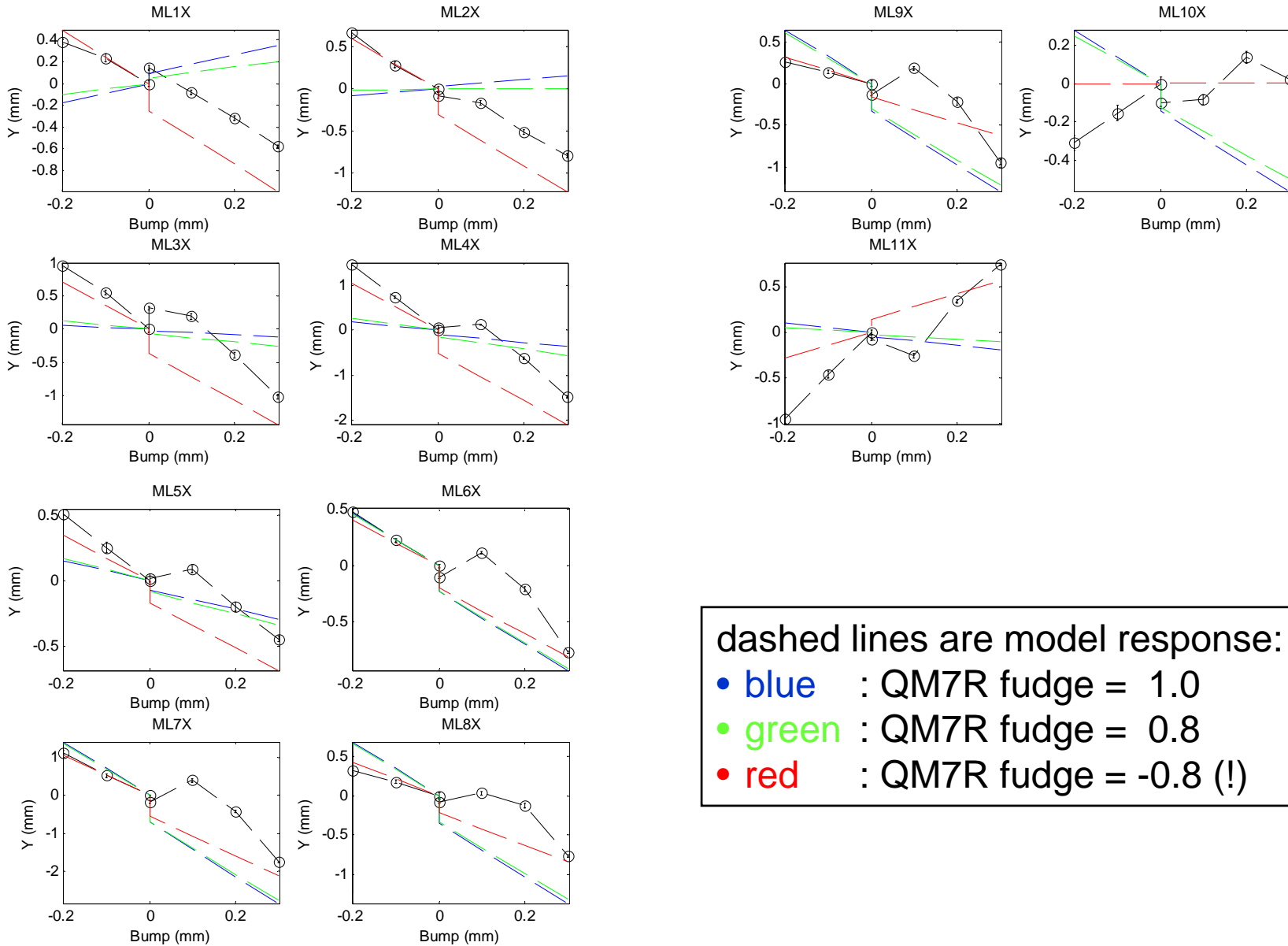
EXT BPMs vs QM7R Vertical Bump: TMIT



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



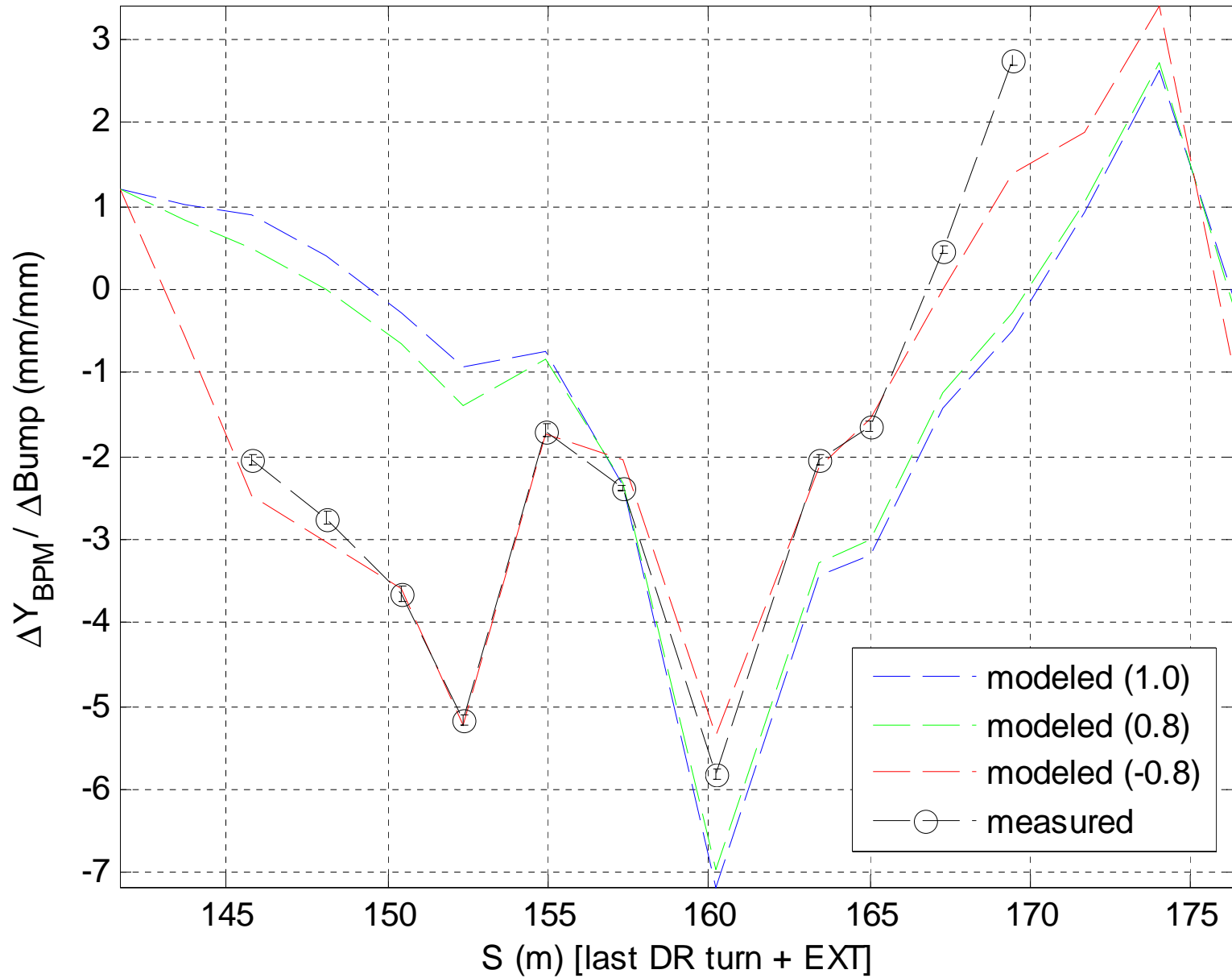
EXT BPMs (1-11) vs QM7R Vertical Bump (>90% TMIT values)



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



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 ...

