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# Fourier Analysis of Booster TBT data

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## Actual Booster data - AC mode (Febraury/March)

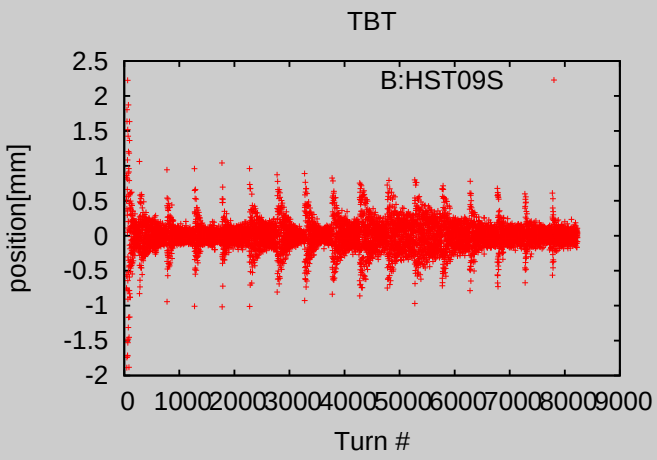
Data sets:

| File | kick | comments | $\hat{\Delta}$ # |
|---|---|---|---|
| TBT-1120464508-00 | h | before changes (not used) | |
| TBT-1204657522-00 | h | before changes | 2 |
| TBT-1204665694-00 | h | after changes | 16 |
| TBT-1205273052-00 | v | after changes | 18 |

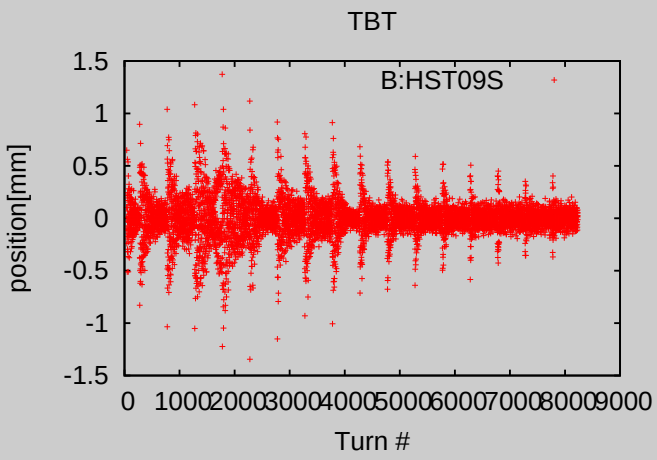
The remaining files (TBT-1205272423-00 for instance) were not useful because the kicker was not firing (?)

Problems ordering the BPMs data for TBT-1204665694-00 and TBT-1205273052-00!

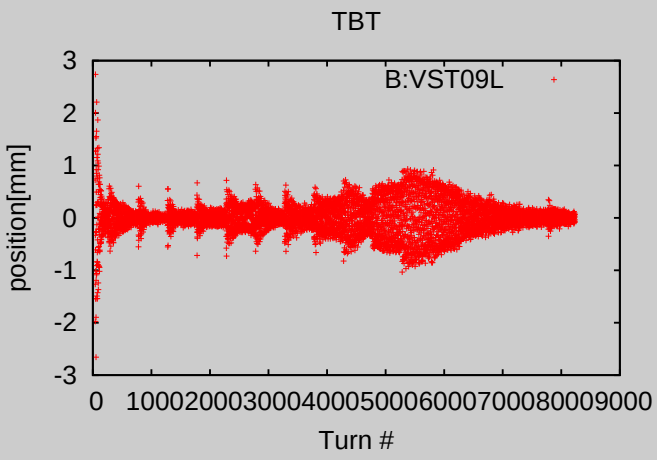
## TBT_1204657522_00



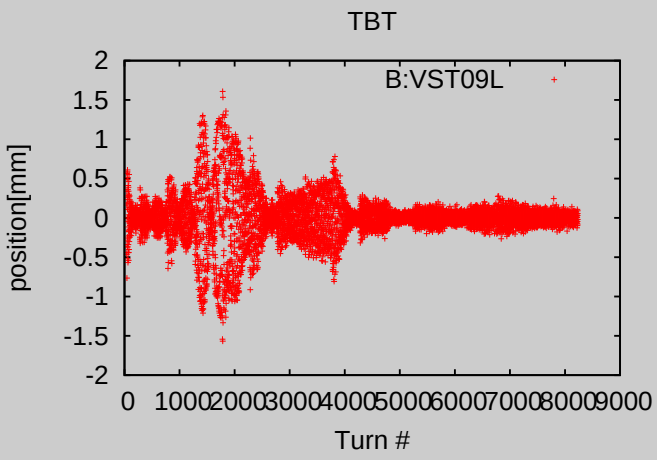

## TBT_1204665694_00



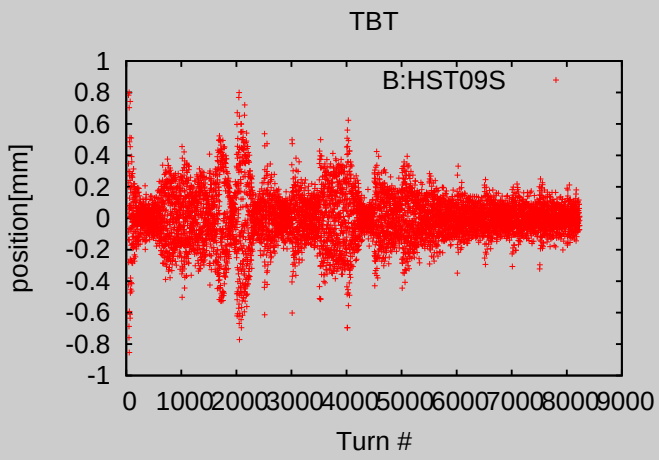

## TBT_1204657522_00




## TBT_1204665694_00



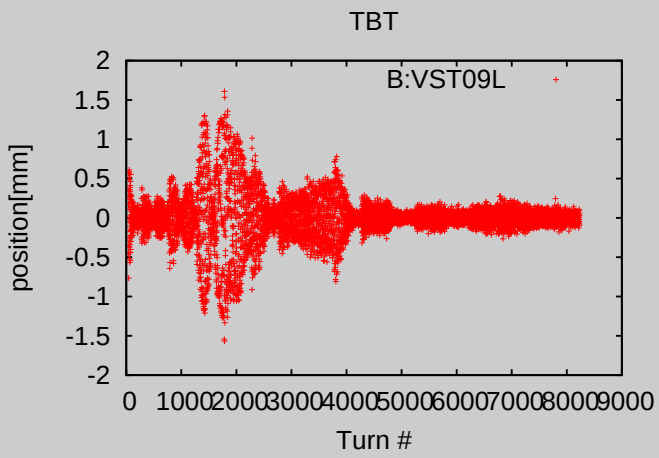
## TBT_1205273052_00



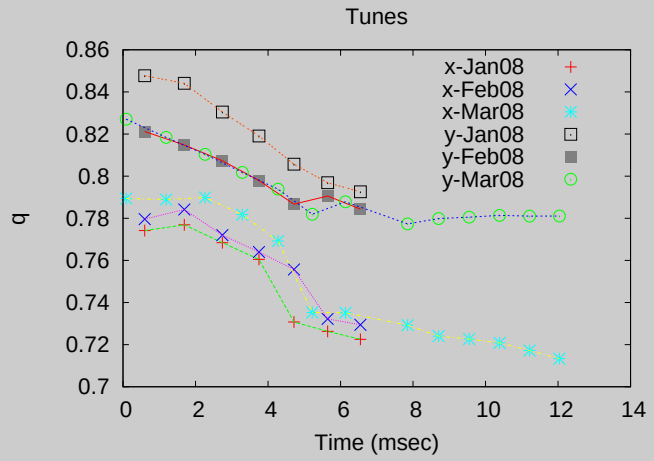

The beam is vertically "unstable", this could explain some of the analysis problems.

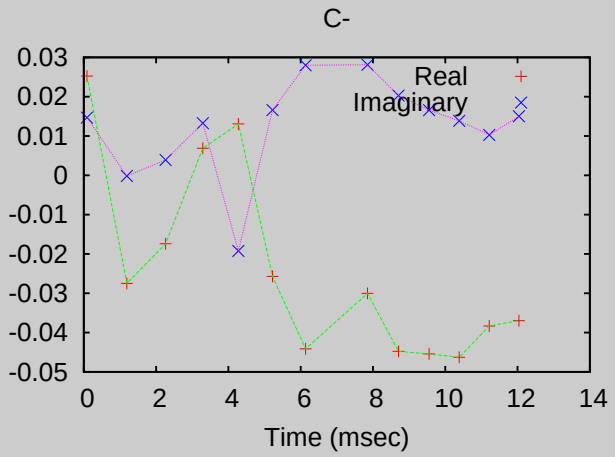
Is the instability related to the corrections?

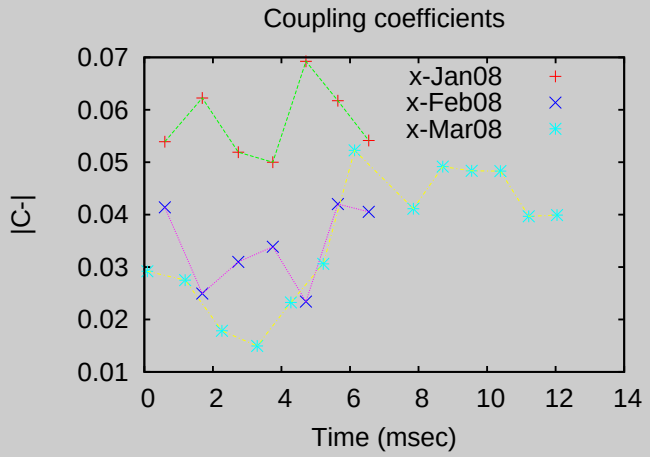
## TBT_1205273052_00



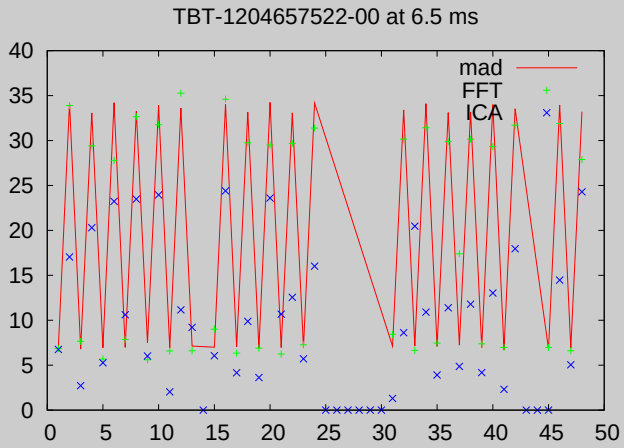
It is still possible to track the tunes (an easier task).



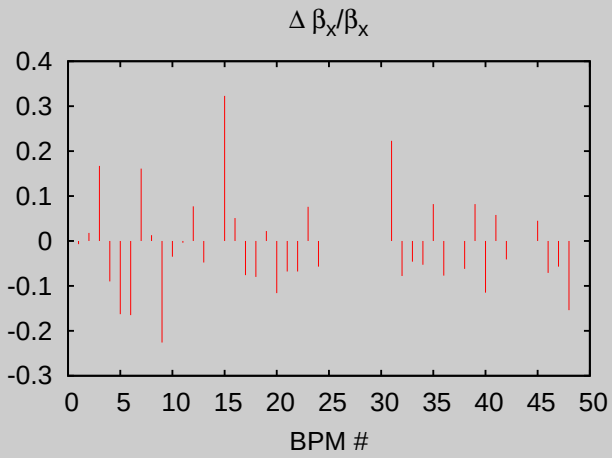



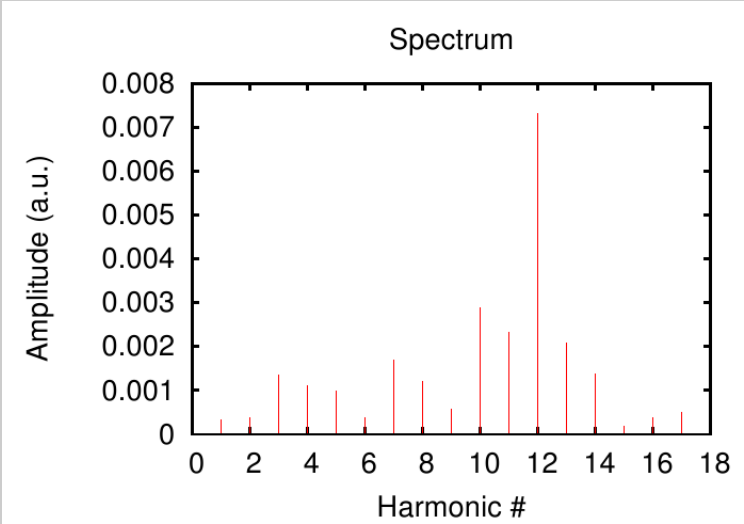
# TBT_1204657522_00



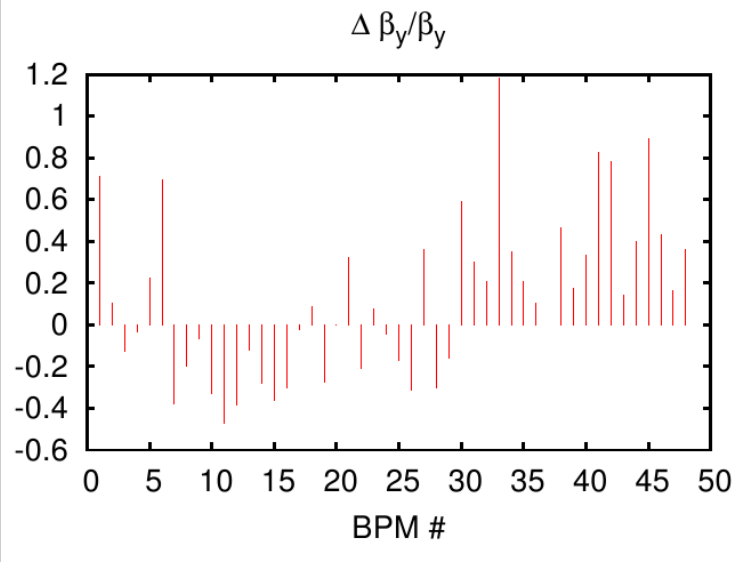

Best result for the (horizontal) optics!

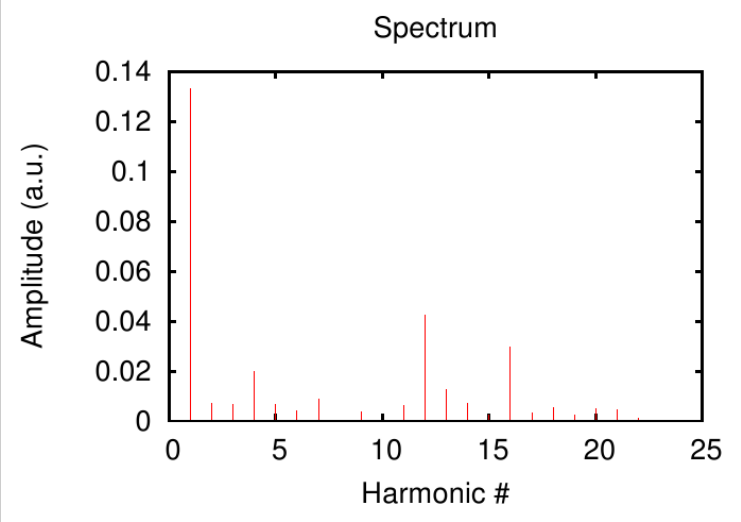
Is the integer part of the tune really 7 ?



# TBT_1204657522_00



Empirical shift of data worked only for TBT_1204657522_00:

| BPM | calibration | shift | BPM | calibration | shift |
|---|---|---|---|---|---|
| B:H(V)ST09L | 1.0604 | $0^{(a)}$ | B:H(V)ST09S | 1.0217 | $0^{(a)}$ |
| B:H(V)ST10L | 1.0050 | $0^{(a)}$ | B:H(V)ST10S | 1.0791 | $0^{(a)}$ |
| B:H(V)ST11L | 1.1194 | $0^{(a)}$ | B:H(V)ST11S | 1.0534 | $0^{(a)}$ |
| B:H(V)ST12L | 1.0000 | 0 | B:H(V)ST12S | 0.9873 | 0 |
| B:H(V)ST13L | 1.1794 | 0 | B:H(V)ST13S | 1.0845 | 0 |
| B:H(V)ST14L | 1.0440 | 0 | B:H(V)ST14S | 1.0231 | 0 |
| B:H(V)ST15L | 1.1214 | 0 | B:H(V)ST15S | 1.0837 | 0 |
| B:H(V)ST16L | 1.0859 | 0 | B:H(V)ST15S | 0.9331 | 0 |
| B:H(V)ST17L | 1.0371 | 0 | B:H(V)ST17S | 0.9788 | 0 |
| B:H(V)ST18L | 1.0917 | 0 | B:H(V)ST18S | 1.0726 | 0 |
| B:H(V)ST19L | 1.0748 | 0 | B:H(V)ST19S | 1.0075 | 0 |
| B:H(V)ST20L | 1.0499 | 0 | B:H(V)ST20S | 1.0174 | 0 |
| B:H(V)ST21L | 1.0990 | 0 | B:H(V)ST21S | 1.0187 | 0 |
| B:H(V)ST22L | 1.0876 | 0 | B:H(V)ST22S | 1.0772 | 0 |
| B:H(V)ST23L | 1.0680 | 0 | B:H(V)ST23S | 0.9731 | 0 |
| B:H(V)ST24L | 1.0138 | $1^{(a)}$ | B:H(V)ST24S | 1.0047 | $1^{(a)}$ |
| B:H(V)ST01L | 1. 0000 | $1^{(a)}$ | B:H(V)ST01S | 1. 0144 | $1^{(a)}$ |
| B:H(V)ST02L | 1. 0000 | $1^{(a)}$ | B:H(V)ST02S | 1. 1302 | $1^{(a)}$ |
| B:H(V)ST03L | 1. 0000 | $1^{(a)}$ | B:H(V)ST03S | 1. 0691 | $1^{(a)}$ |
| B:H(V)ST04L | 1. 0496 | $1^{(a)}$ | B:H(V)ST04S | 1. 0829 | $1^{(a)}$ |
| B:H(V)ST05L | 1. 0925 | $1^{(a)}$ | B:H(V)ST05S | 1. 0907 | $1^{(a)}$ |
| B:H(V)ST06L | 1. 0261 | $1^{(a)}$ | B:H(V)ST06S | 0.9859 | $1^{(a)}$ |
| B:H(V)ST07L | 1. 0705 | $1^{(a)}$ | B:H(V)ST07S | 1. 0380 | $1^{(a)}$ |
| B:H(V)ST08L | 1. 0746 | $1^{(a)}$ | B:H(V)ST08S | 1. 0641 | $1^{(a)}$ |

$(a)$ as for January data