Summary of the Study on the layout of the DTL BPM and Steerers

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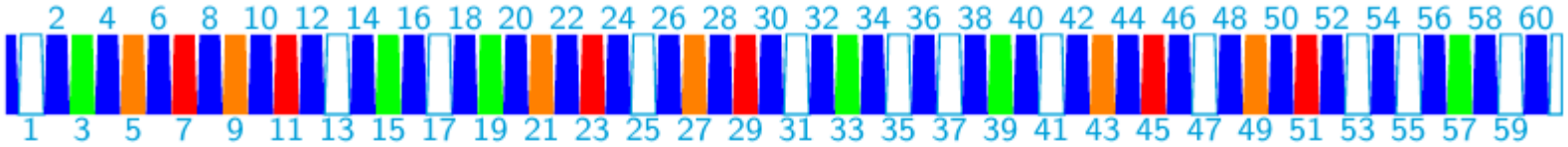
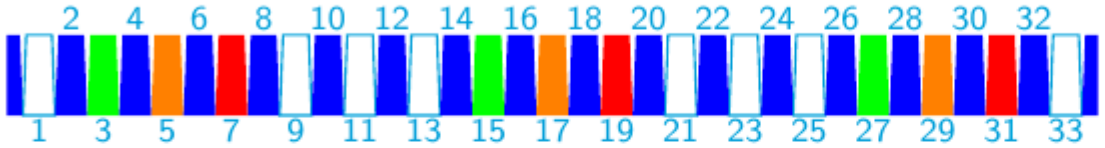
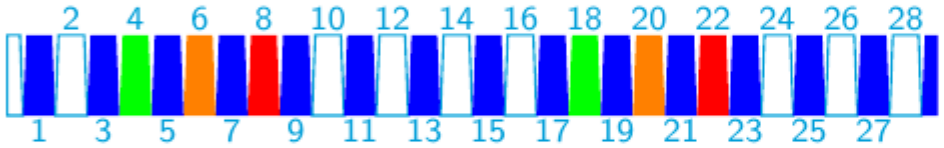
Conditions and guidelines

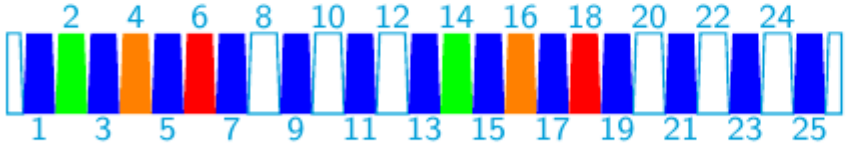
- Try to find a layout with ~15 BPMs and ~15 steerers per plane.
- No BPM or steerer in the first empty tube.
- At least 2 BPMs per tank for the time-of-flight measurement. (Just for the trajectory correction, layouts with 1 BPM in the tank 5 may be more “efficient”.)
- Take into account the injection (from MEBT) and the extraction (to LEDP).
- The layout should work well with the simple 1-to-1 correction scheme. (Considering the time of the commissioning.)
- The layout should work well with linear algorithms, e.g., without applying a limit to the steerer strength (off course except the hardware limit of 16 Gm).
- The layout should work well within the limit of 16 Gm strength against the standard set of errors.
- Try to improve the situation of the tanks 1 and 2 as possible.

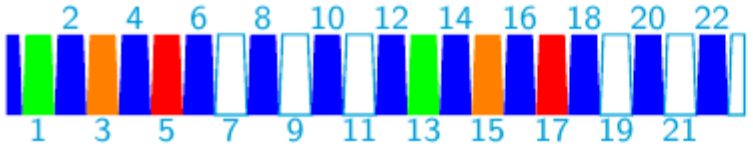
The best compromise found







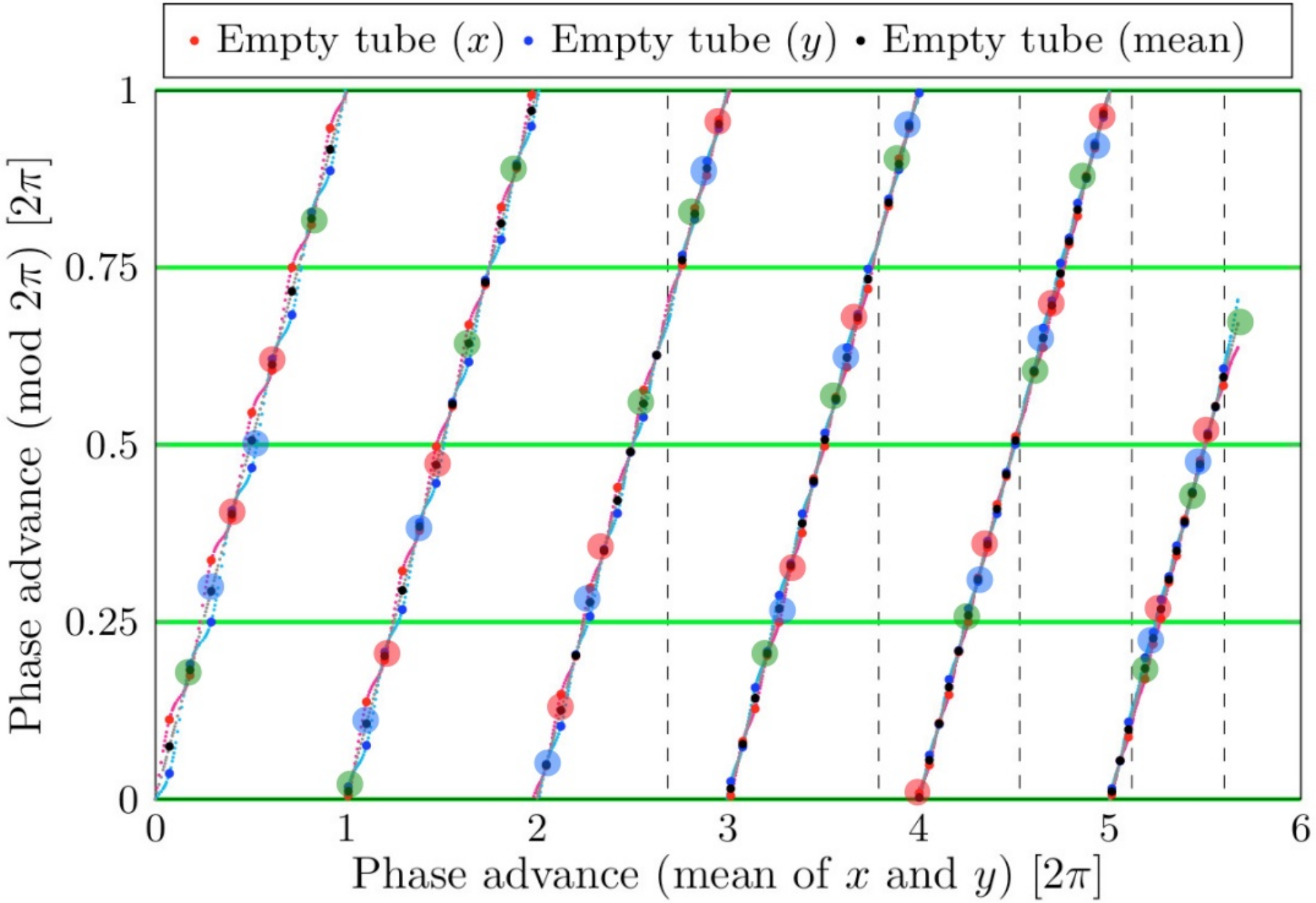




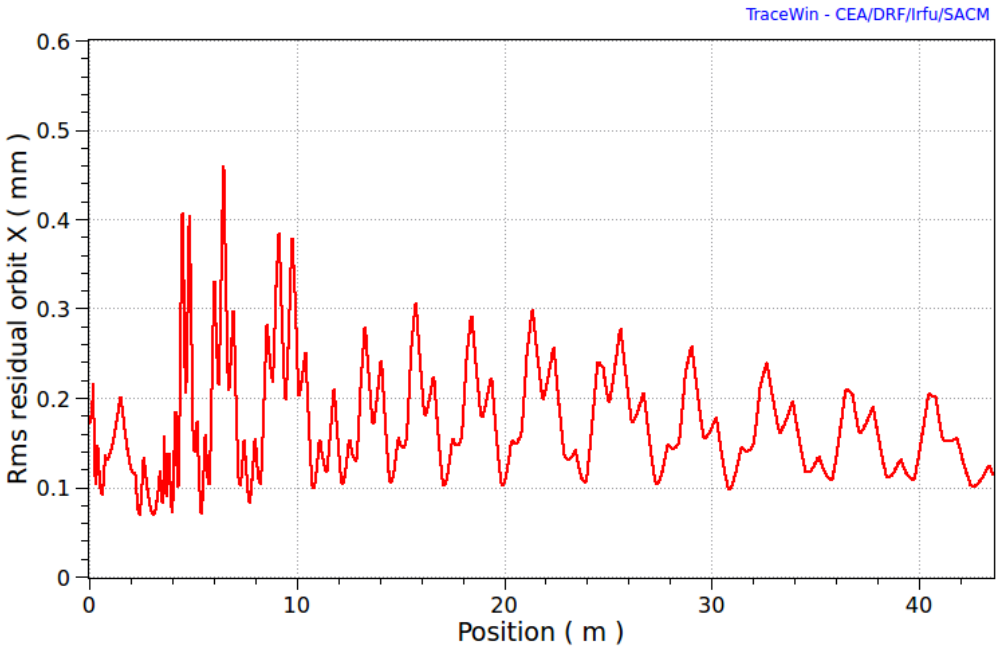
15 BPMs (63222)
15 steerers (63222)

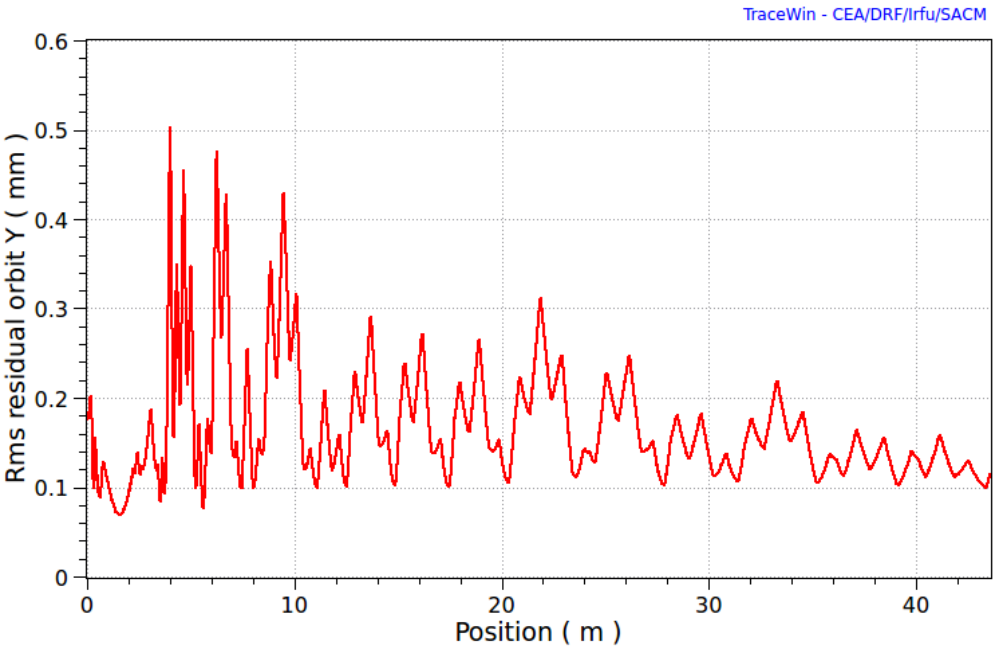
Steerer X, Steerer Y, BPM.

The same thing in a different format...



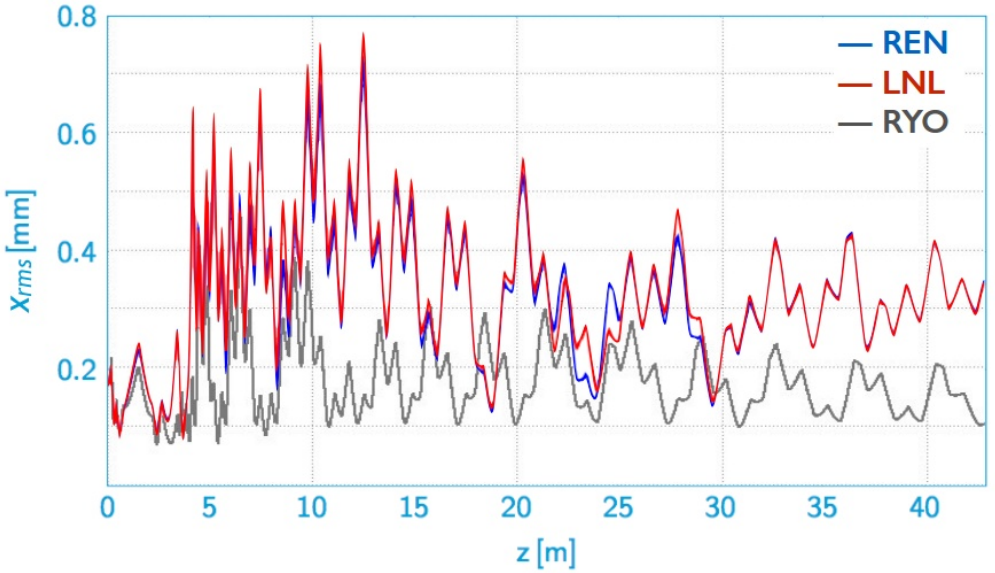
Performance check

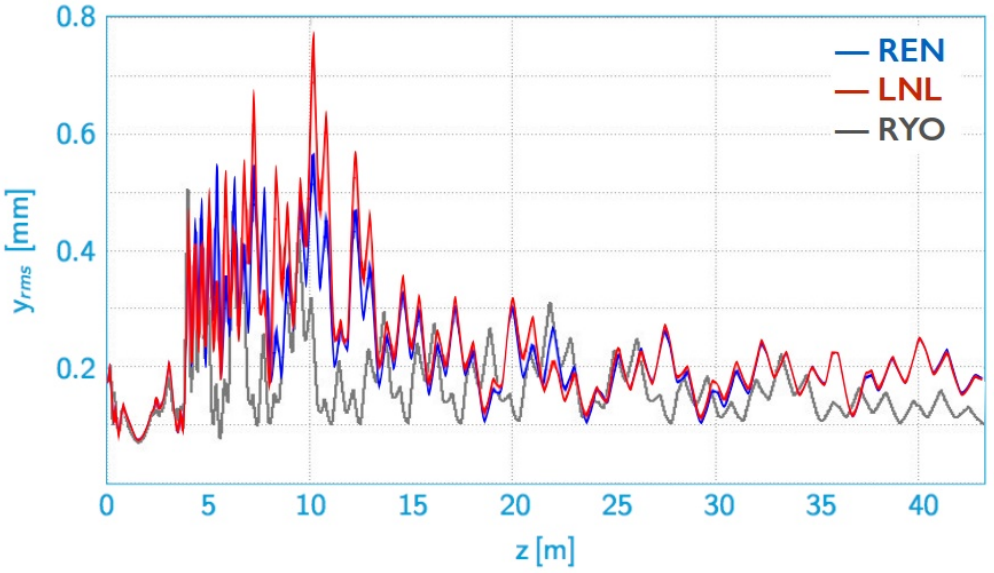




Compared to the layout of IPAC15, the new layout works better in the tanks 1 and 2. In the tanks 3-5, the performance is slightly worse but comparable.

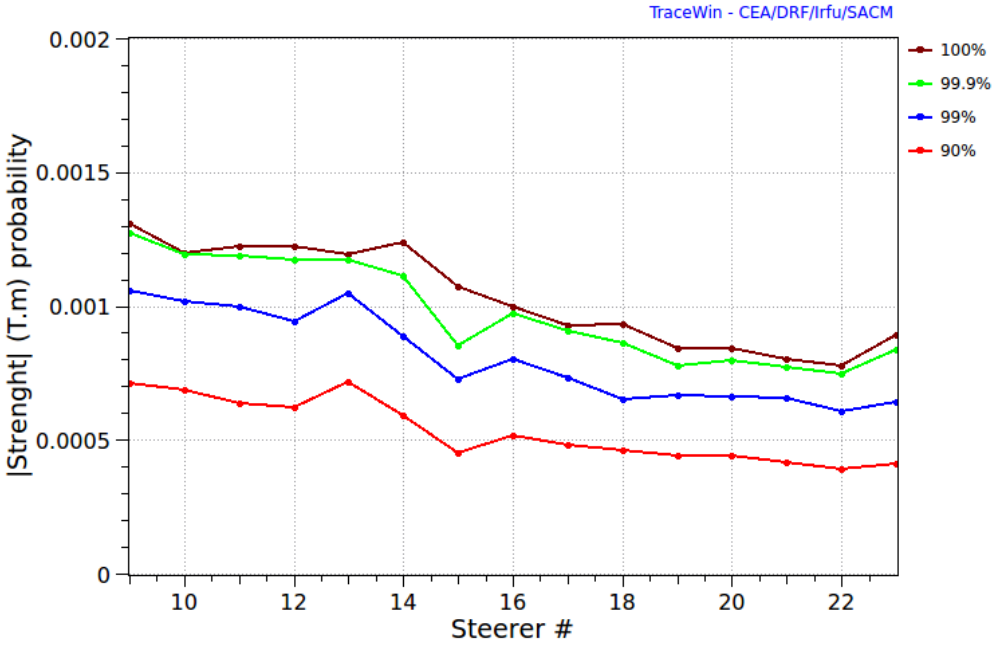
Comparison with current baseline(s?)

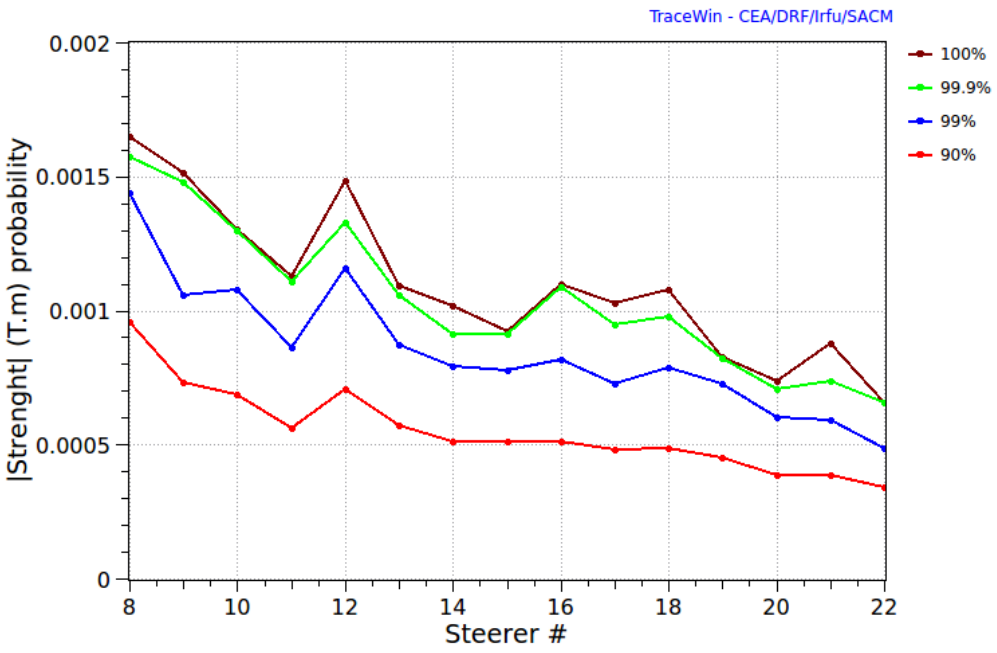




- Note the conditions are the same but the random seeds are not identical. (Shouldn't be a big issue for 1000 runs.)

Checking the steerer strengths





- Left: BLy, right: BLx
- 99.9% line has the peak of 16 Gm. Perfect consistency between the steerer strength and alignment specification :)
- Note in the MEBT 8 X steerers and 7 Y steerers are used.

Time for questions and discussions...