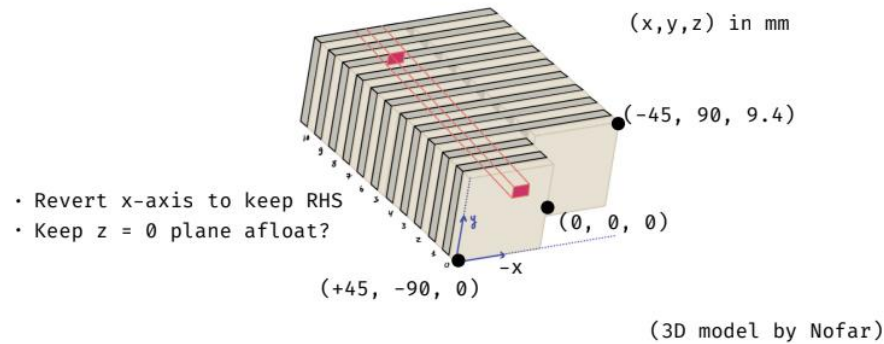


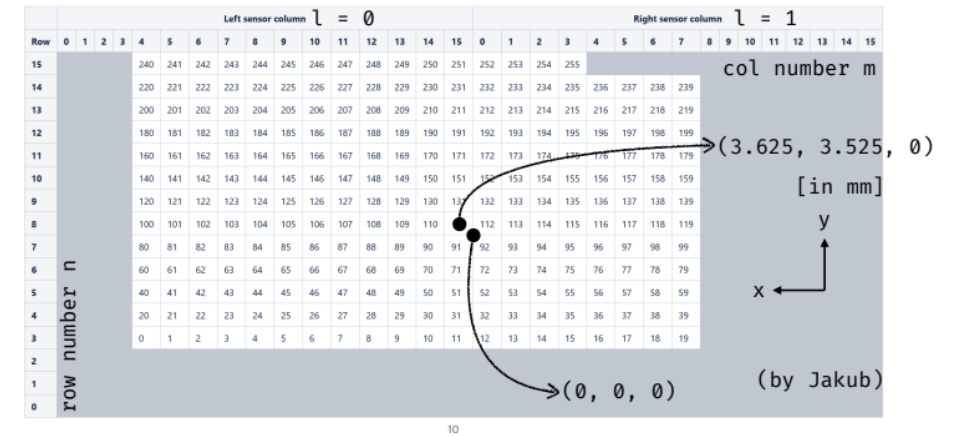
Hough Transform for TB 2025

Sensor coordinate system

(Proposed) coordinate system in mm



Channel layout scheme (2D)



Channel coordinates

- Calculate pad centre from sensor "l", column "m", row "n":

$$x = 3.625 - 5.53 \cdot (m-15) - 90.2 \cdot l$$

$$= 86.575 - 5.53 \cdot m - 90.2 \cdot l$$

$$y = 2.765 + 5.53 \cdot (n-8)$$

$$= -41.475 + 5.53 \cdot n$$
- Calculate l, m, n from channel ID "ch" (in TB2025):

$$l = \text{if}(ch \% 20 < 12): 0$$

$$\text{else}: 1$$

$$m = 4 + ch \% 20 - 16 \cdot l$$

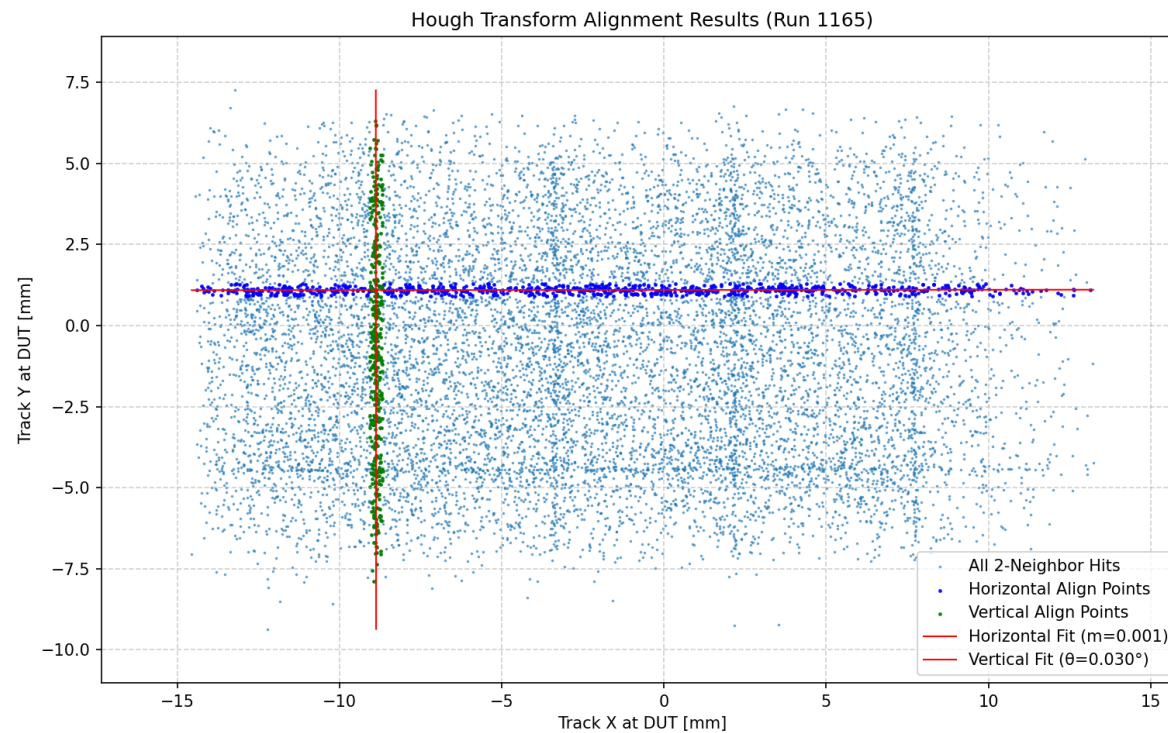
$$n = 3 + ch // 20$$
- Calculate absolute z coordinate in tele system from slot "k":

$$z = (388-1.2) + 4.7 \cdot (k-14)$$

$$= 321 + 4.7 \cdot k$$

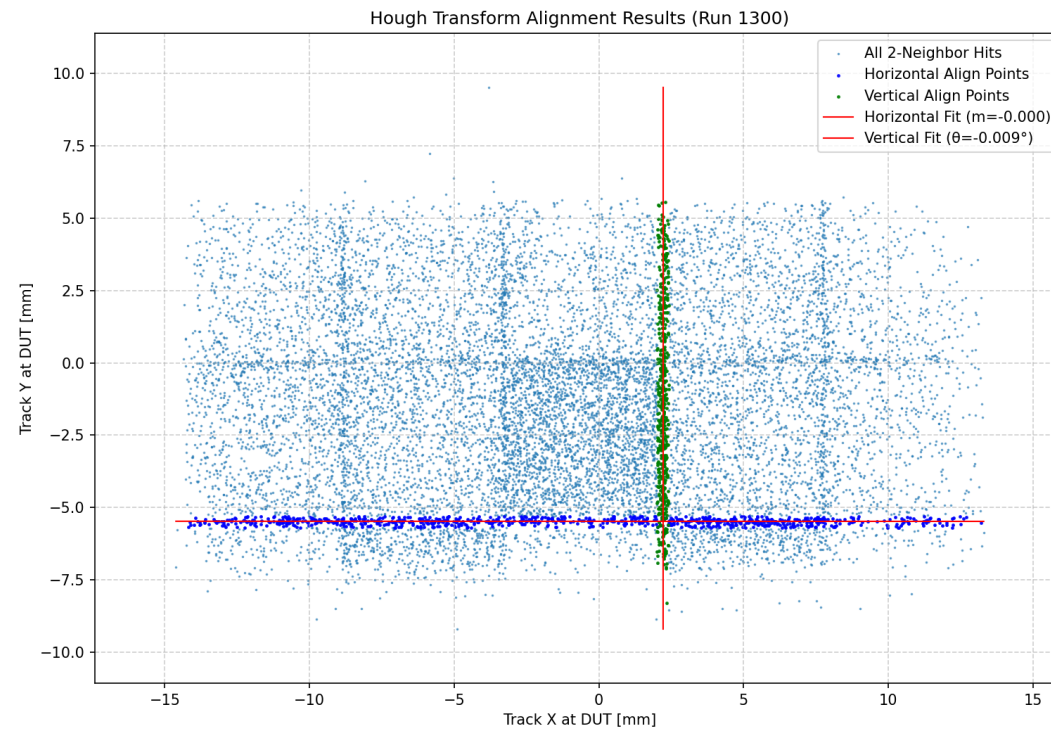
Alignment Examples

11 X_0 ; Centre left sensor



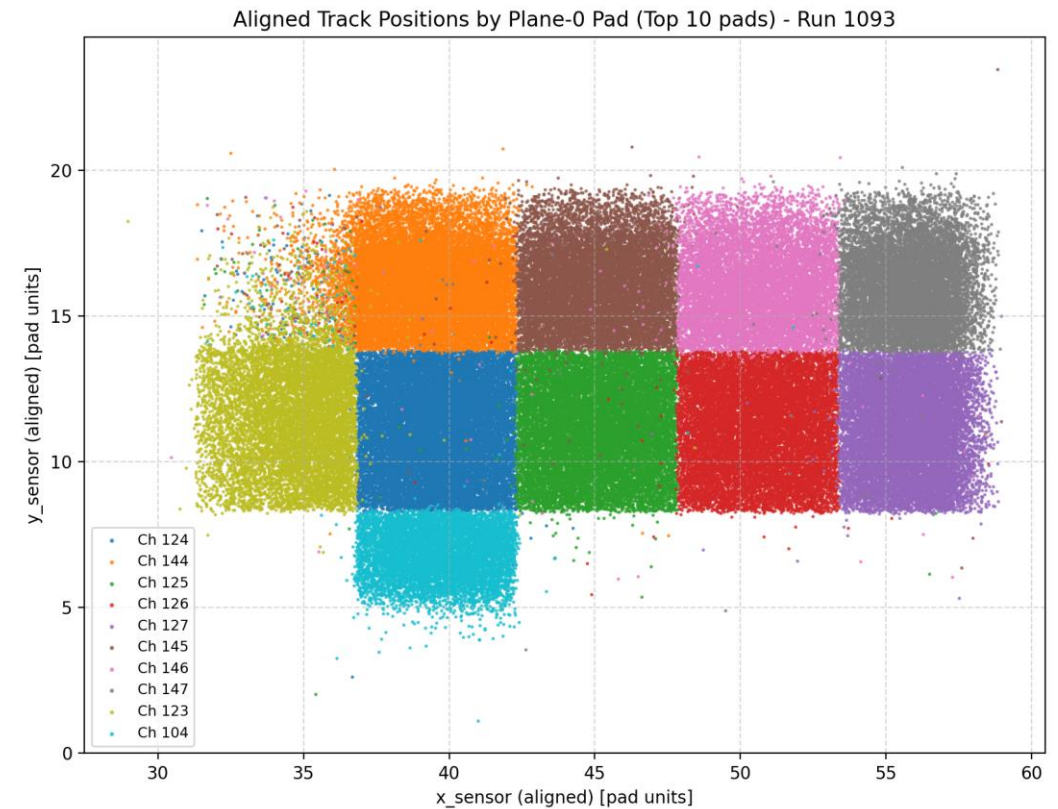
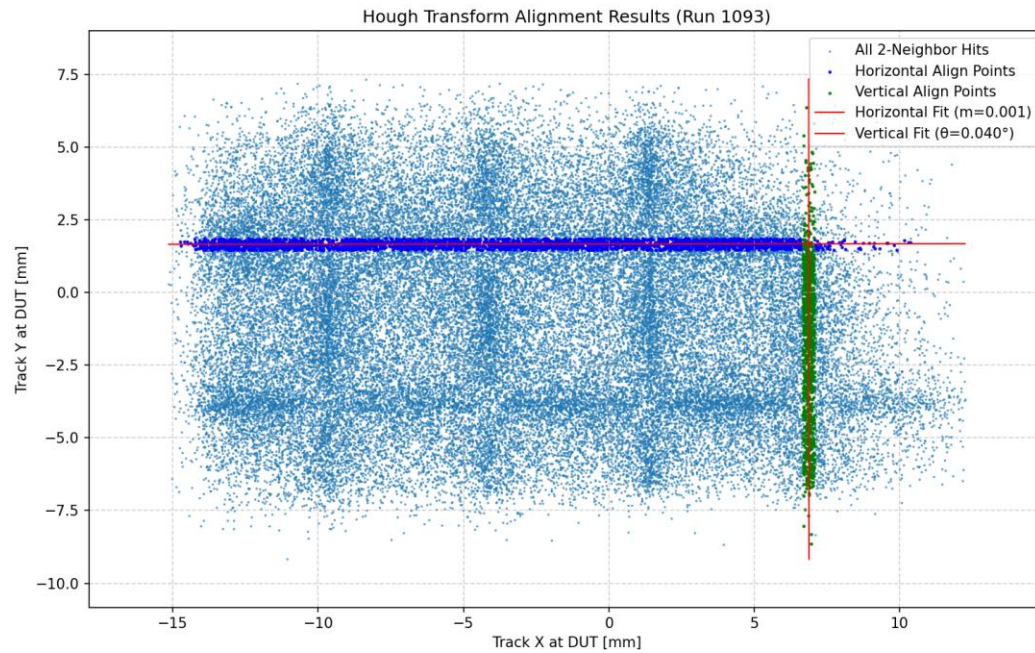
Alignment Examples

11 X_0 ; Top left sensor



Alignment Examples

9 X_0 (alignment after 1 X_0); Centre left sensor



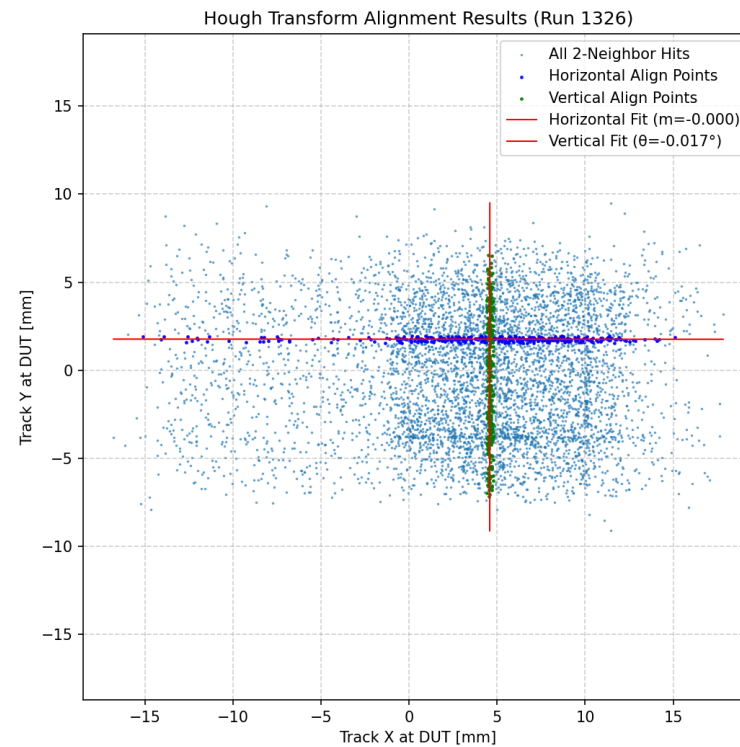
(Grid mistakenly used from previous sensor coordinate system)

Alignment Examples

11 X_0 ; Gap position

Still testing success of final
coordinate system in this case

(previous version did not have a
gap)



Final Notes

- Aligned root file provided as output (w. diagnostics plots)
- To be tested further, but potentially can be used already
- Rotations in the x-z plane – to be implemented

Thank you!