

Laser Scan Local Flatness

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Algorithm - Data Selection

- Eliminate the points with a RMS larger than 15 (about 1% of the data points were eliminated)
- For a module, in each 5by5 area, eliminating the points with a difference larger than 40um compared to averaged value, choose the maximum height.

If the qualified points are less than 11, discard this 5by5 area, then assign height 0 for this area.

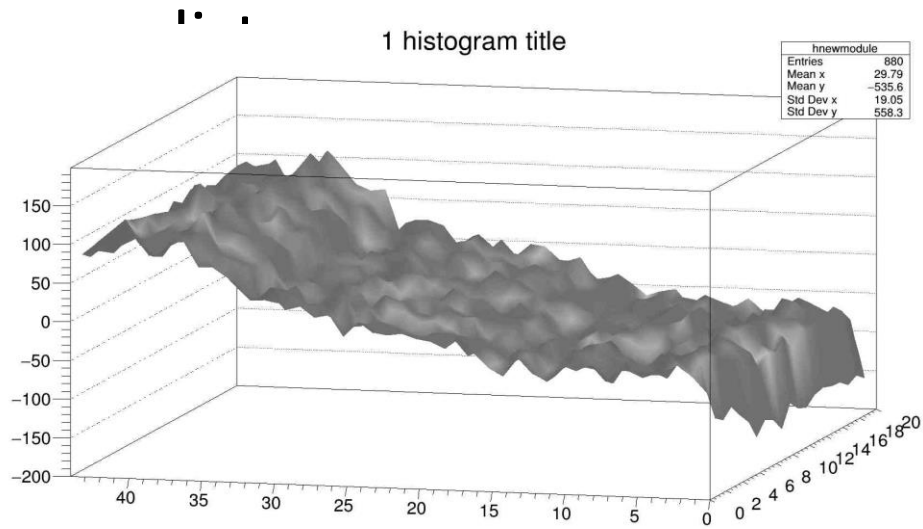
- Save the maximum height and actual XY coordinates (98*220)

Algorithm-Calculating Plane

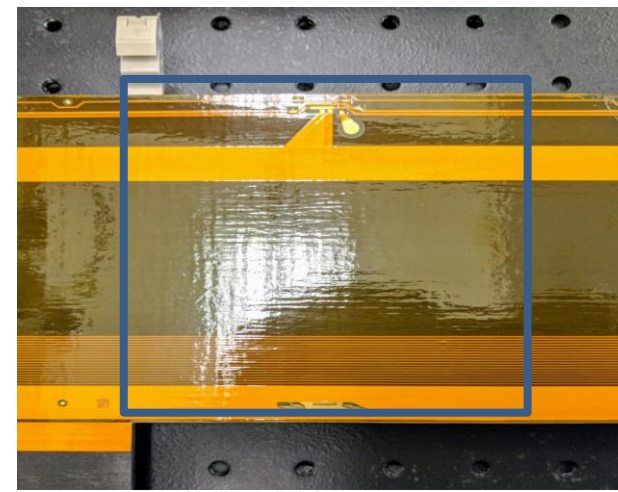
- Loops for selecting points $\{ \text{for } i=1 \dots 40 \{ \text{for } j=1 \dots 20 \{ \text{for } k=1 \dots 40 \dots \} \} \}$
- Skip the cases when any two selected points are same, three points are aligned, any selected point is bad (0 height)
- Calculate the potential plane using three points. Drop the plane if any calculated height is lower than the corresponding scanned data. (only test with all points used for calculating potential plane)
- Find maximum distance by calculating all the distances from points to potential plane in 98×220 area, each will result additional 98×220 loops.
- Find the minimum by comparing the values from other planes

Module 2 Results

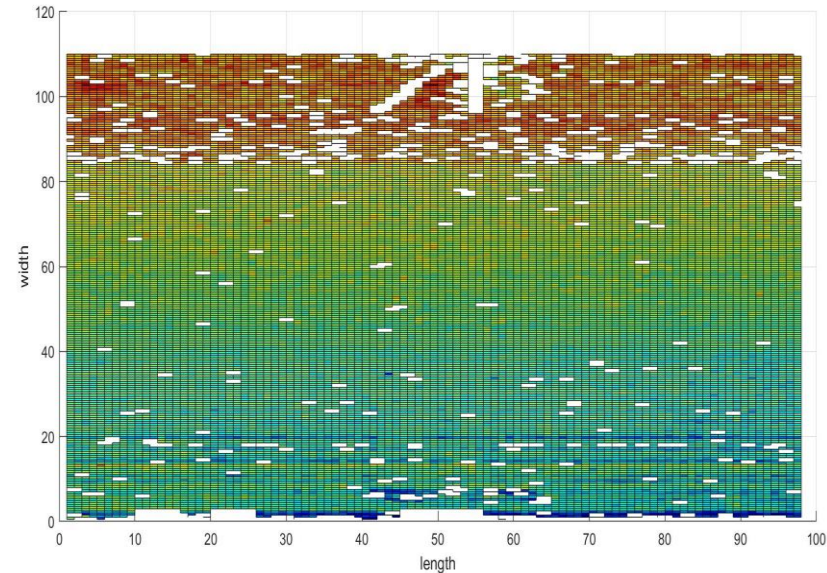
- Outputs: coordinates for discarded area, if possible
- points forming the plane;
- the plane function; the



points used for forming potential plane after applying selection rules.
moved to center, 20*44area



Module 2



Data points in 98*110 (mm) area
Blank area represents eliminated points