Revised Pixel Efficiency Readings from the TPAC 1.2 Test Beam

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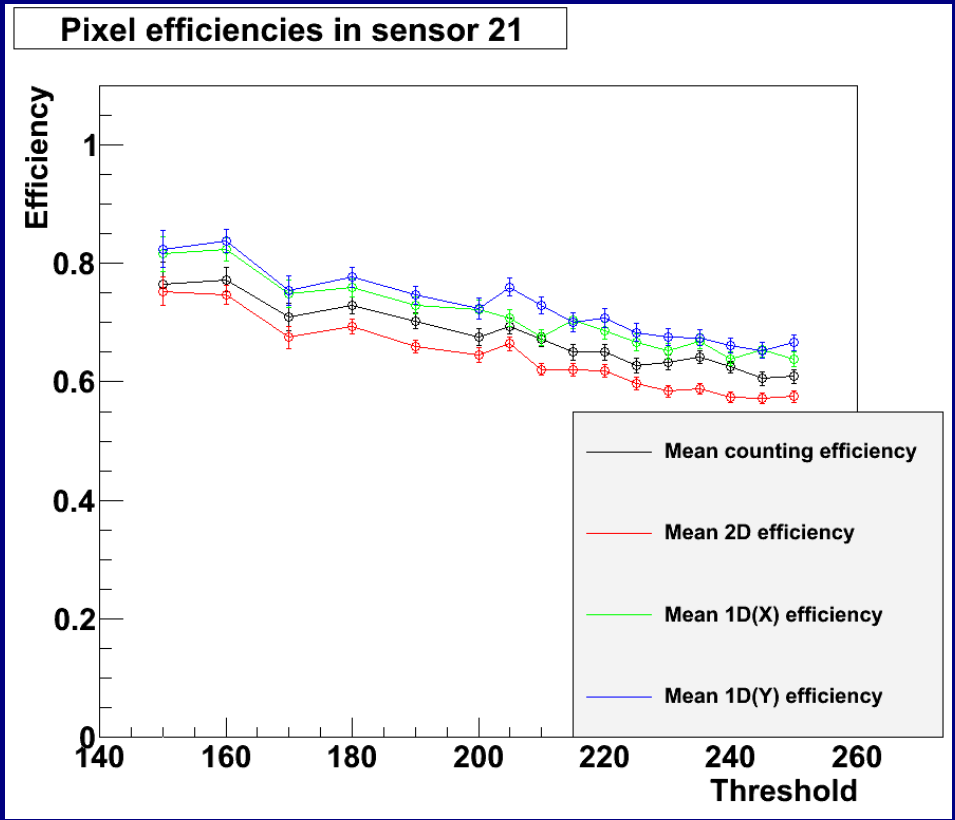
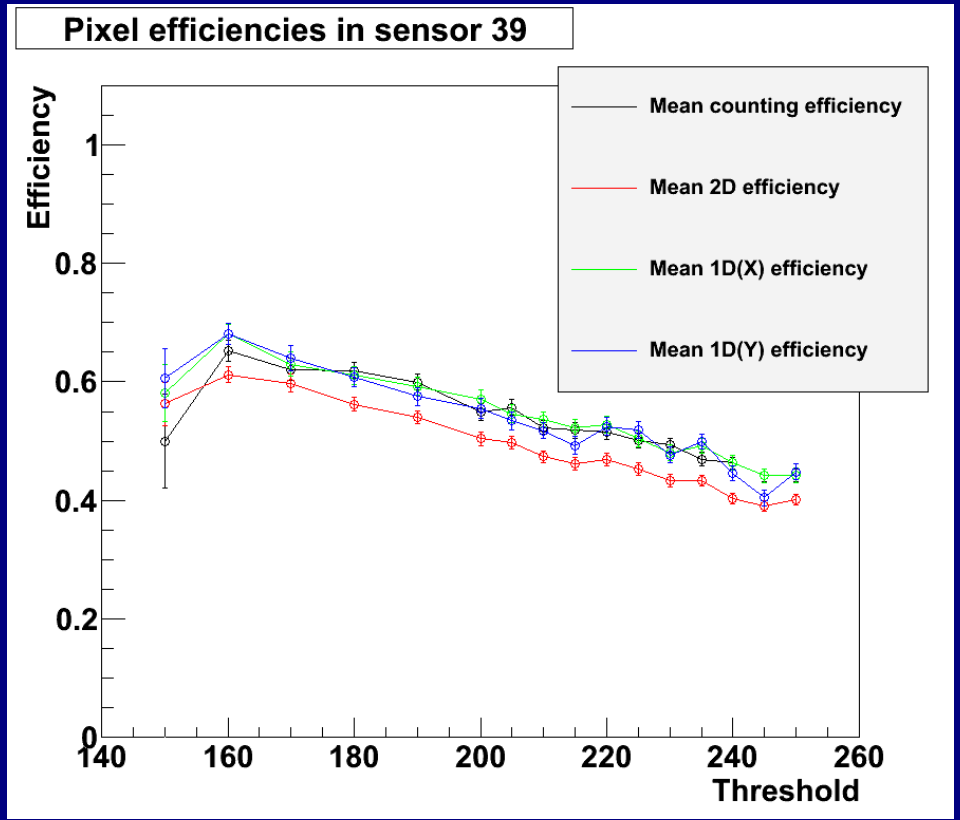
26/01/2010

Initial Results (sensors 21 and 39)





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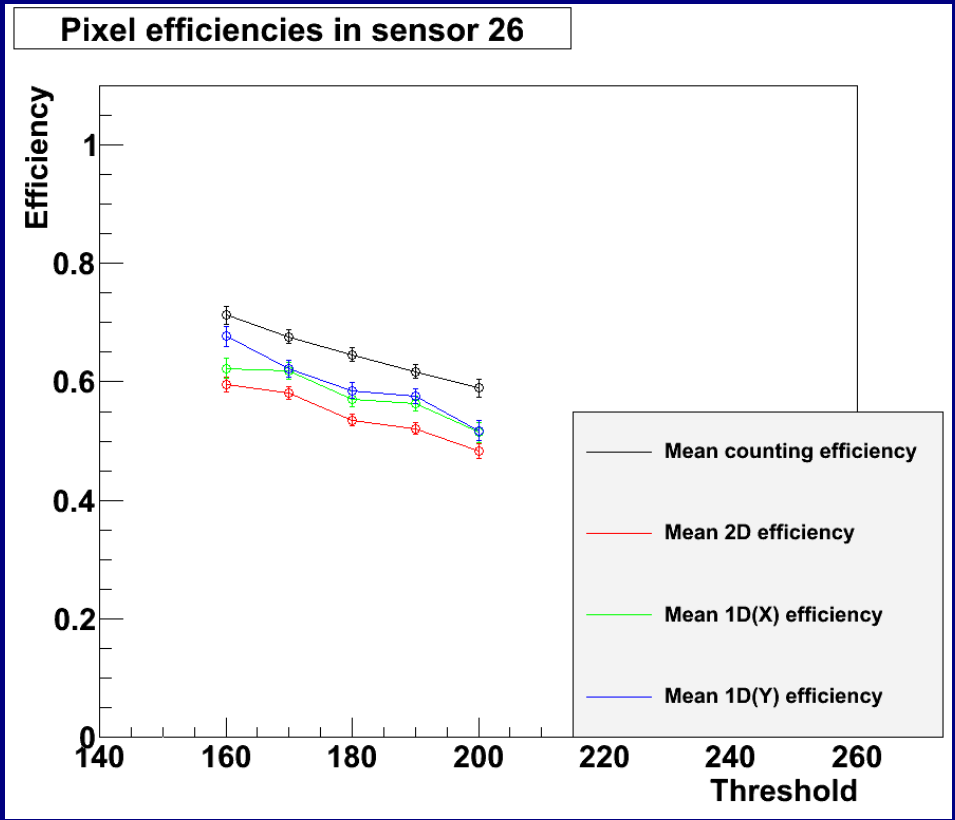
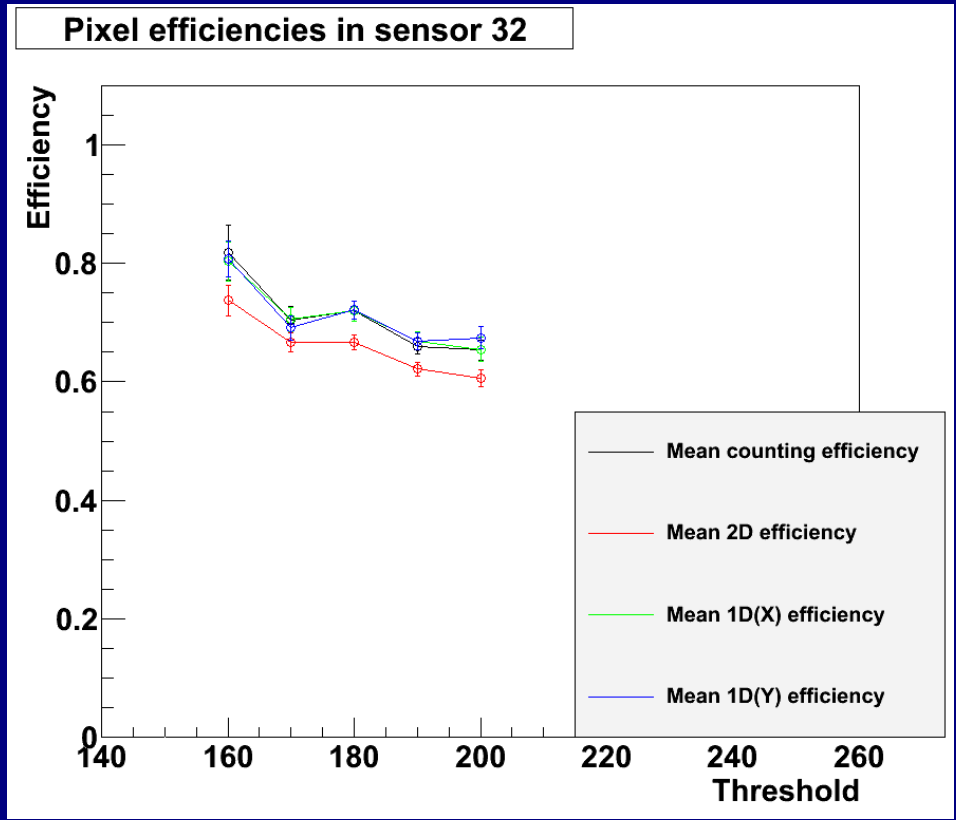
Initial Results (sensors 26 and 32)





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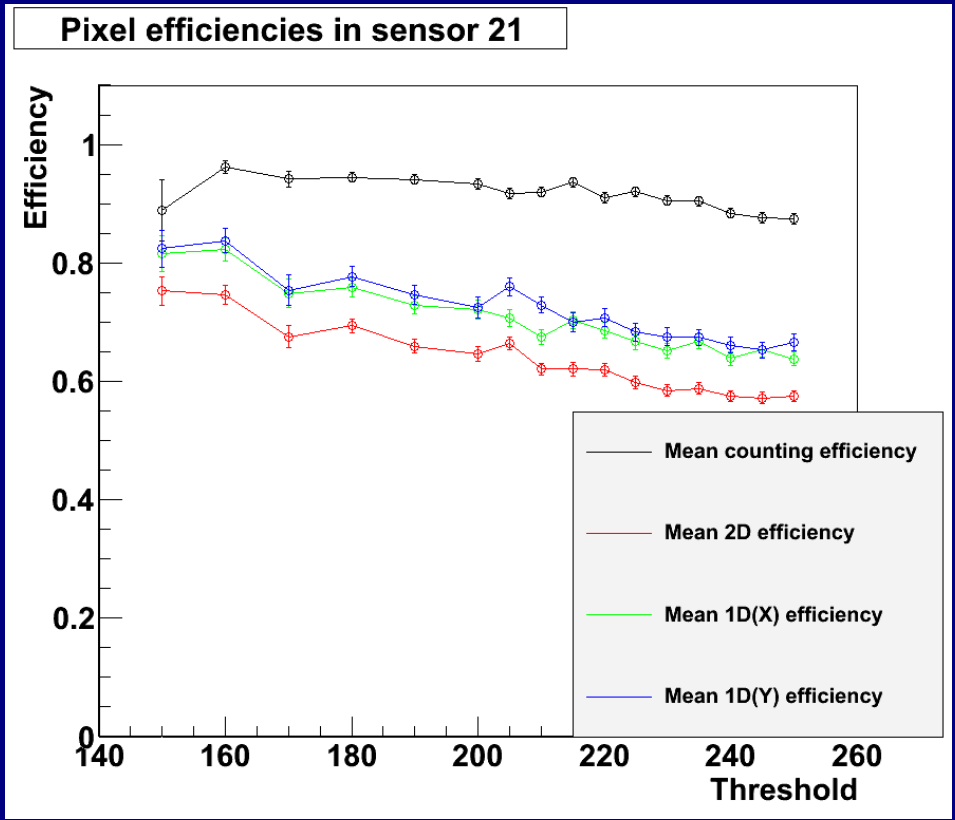
Edge Effects

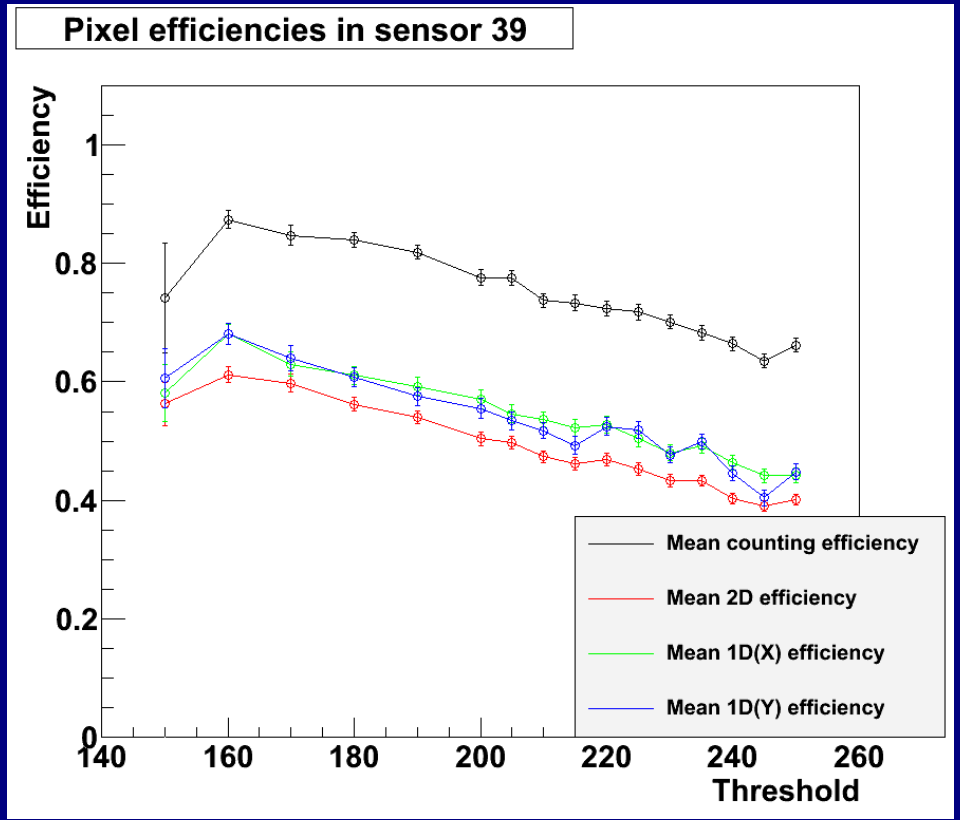
The problem with edge effects in the counting method:

- Search area for a track might encompass part of a pixel without covering the centre.
- If that happens there is a reasonable chance the test beam particle passed through that pixel, but any hits on that pixel would not be recorded as confirming the track (decreasing apparent efficiency).

Solvable by adding 25μm to the search ranges of each track.

Modified Results (sensors 21 and 39)





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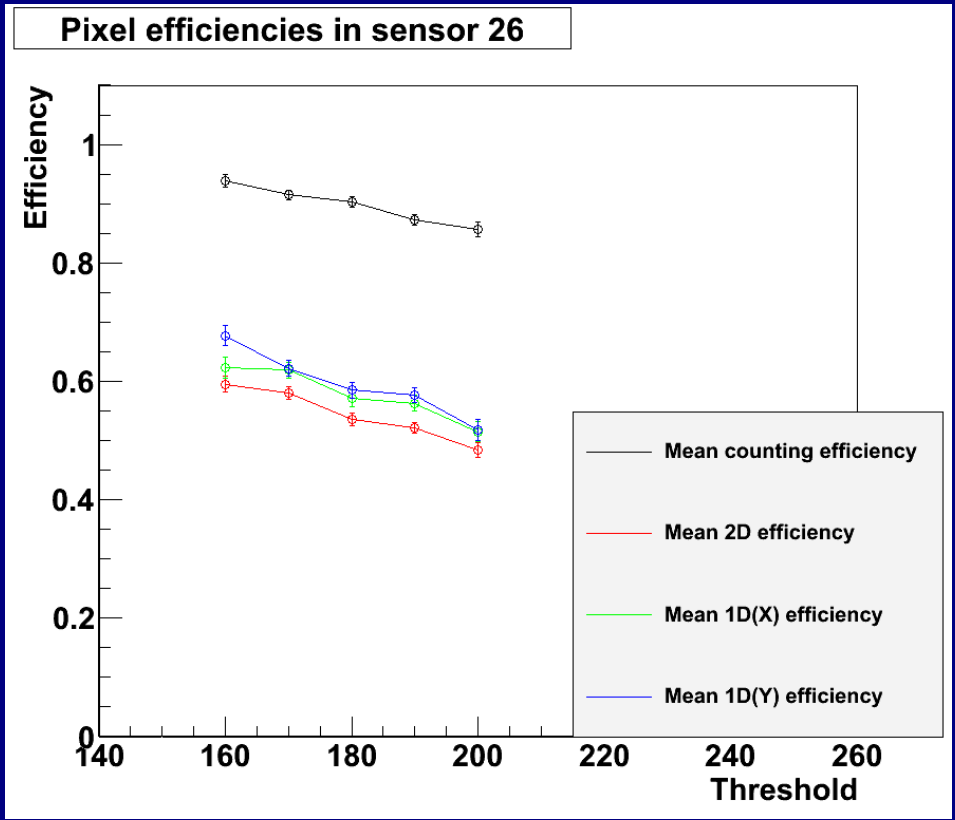
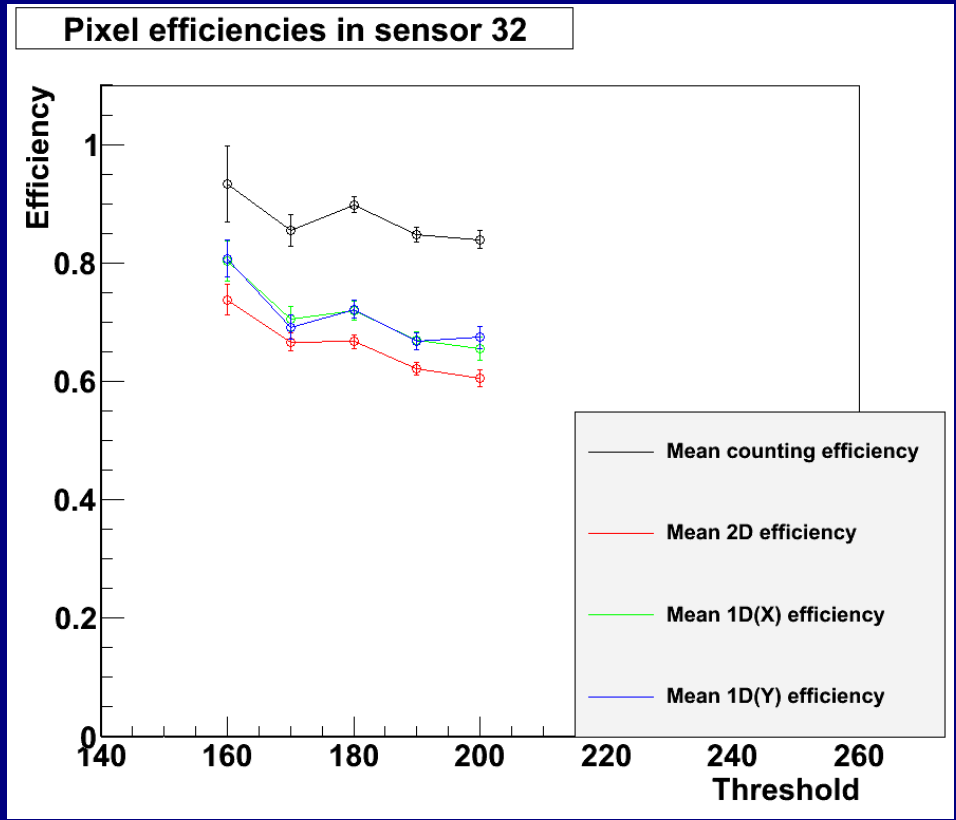
Modified Results (sensors 26 and 32)





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Extensions

Remaining problem: Charge diffusion causing hits in pixels near where test beam particles passed through.

- If this happens then it is possible for the pixel where a test beam particle passed through to not register a hit, but still have the track confirmed by the counting method (i.e. Increasing apparent efficiency).

This might be solved in two ways:

- Filter the tracks so that only the tracks where the one sigma search range is entirely within a single pixel.
- Use a weighted counting method, where each pixel is assigned a weighting according to the likelihood that it confirms the track.