Negative ion measurements

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Lepcol meeting

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Negative ion measurements

Run 1042

- Ar/iC4H10/CS2 95/4.5/0.5 gas mixture
- Drift field is $-280\,\mathrm{V/cm}$ and grid voltage is $-380\,\mathrm{V}$

Run 1043 – 1051

- Ar/iC4H10/CS2 95/5/1.4 gas mixture (1h flush)
- Drift field is $-150\,\mathrm{V/cm}$ to $-400\,\mathrm{V/cm}$ and grid voltage is $-380\,\mathrm{V}$

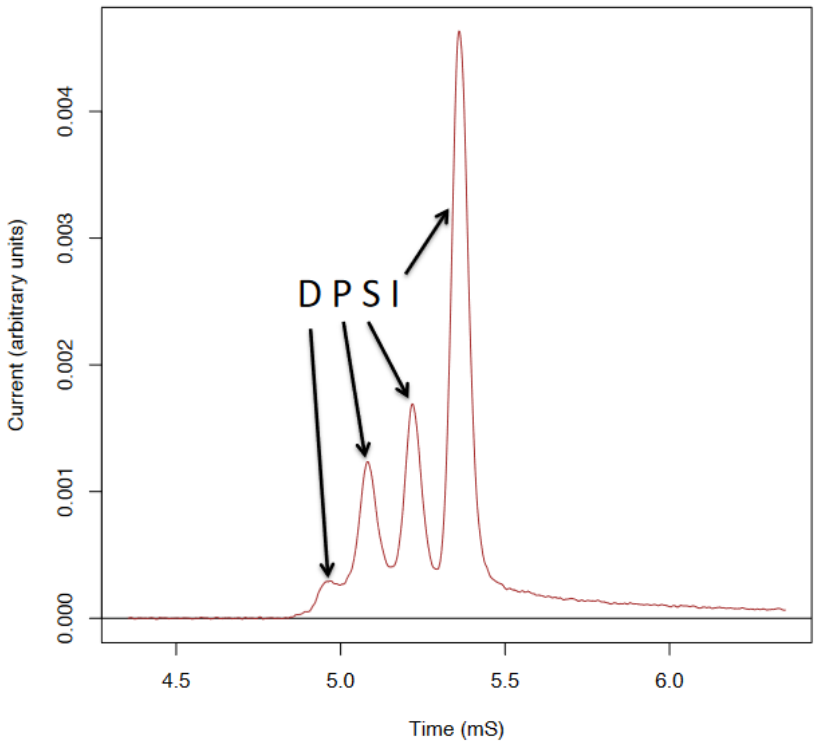
Run 1065 – 1073

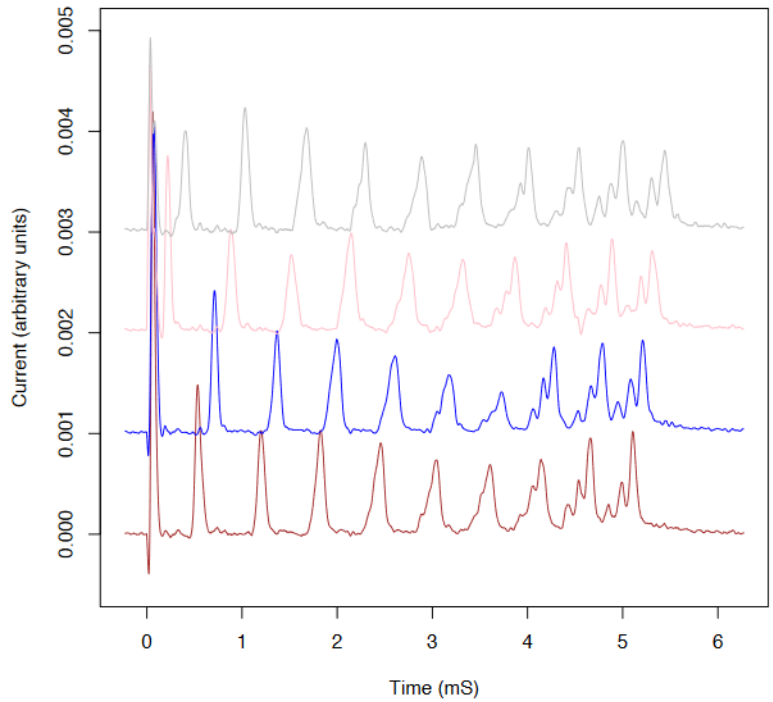
- Ar/iC4H10/CS2 95/5/1.4 gas mixture (2h flush)
- Drift field is $-100\,\mathrm{V/cm}$ to $-500\,\mathrm{V/cm}$ and grid voltage is $-380\,\mathrm{V}$

Nikhef

Minority cariers

We have a different number of minority carriers than other measurements in CF4:CS2:O2 30:10:1 and CS2:O2 40:1 gas mixtures
https://arxiv.org/abs/1308.0354

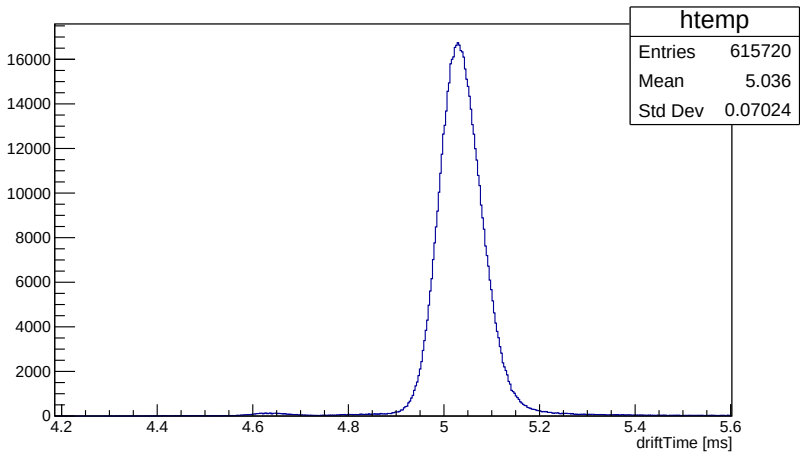


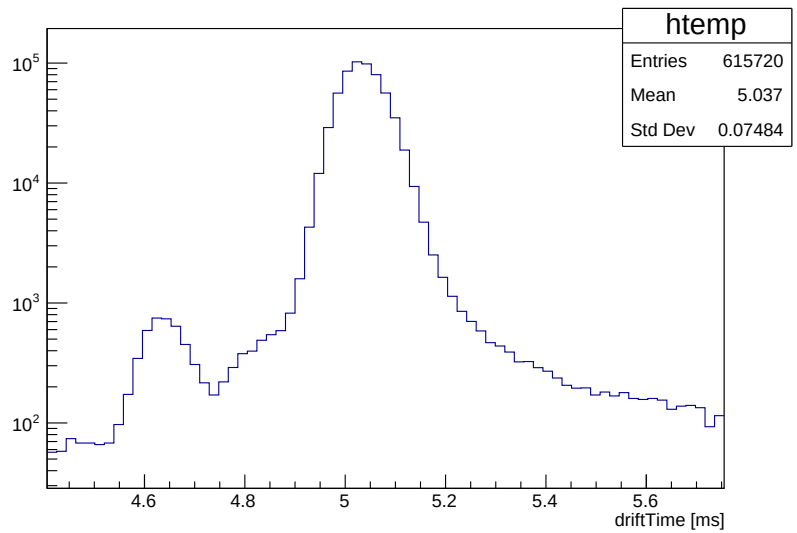


Is this due to the water concentration?

High statistics run

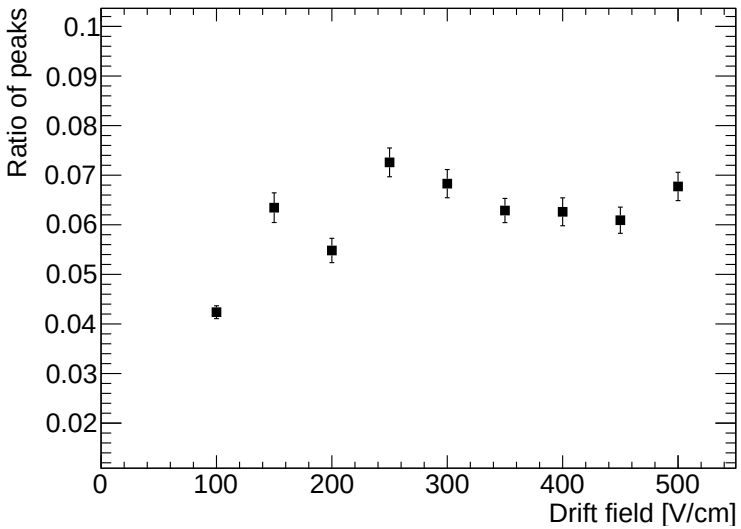
High statistics run 1063 right after flushing does not help to see more than one ion peak.





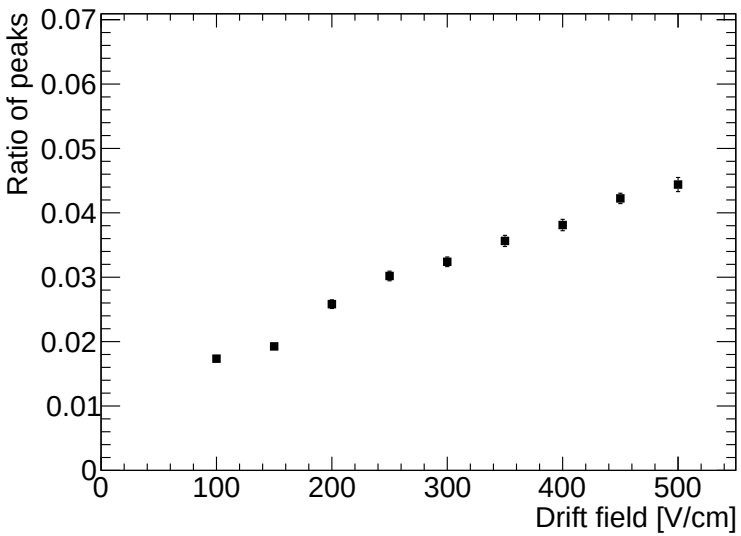
Peak ratio roughly constant

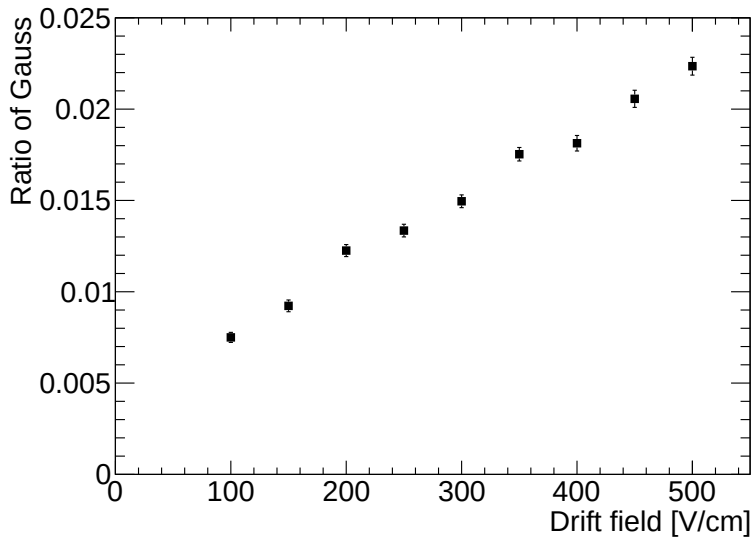
runs 1043 – 1051



Gauss ratio increasing

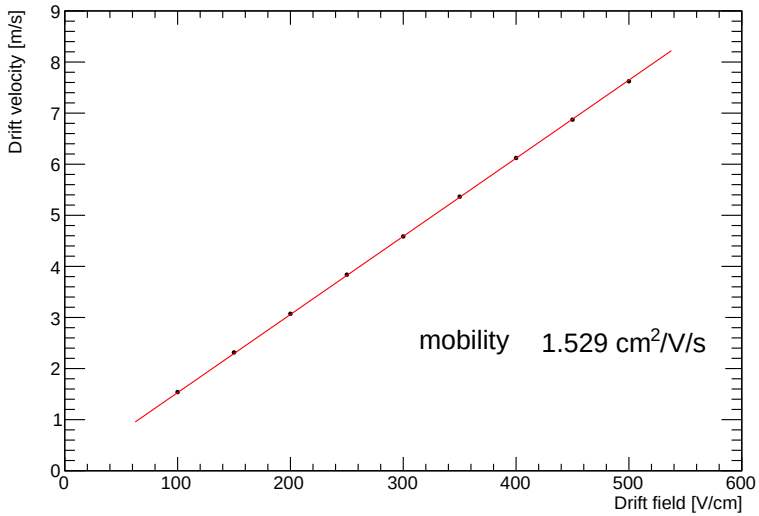
runs 1065 – 1073

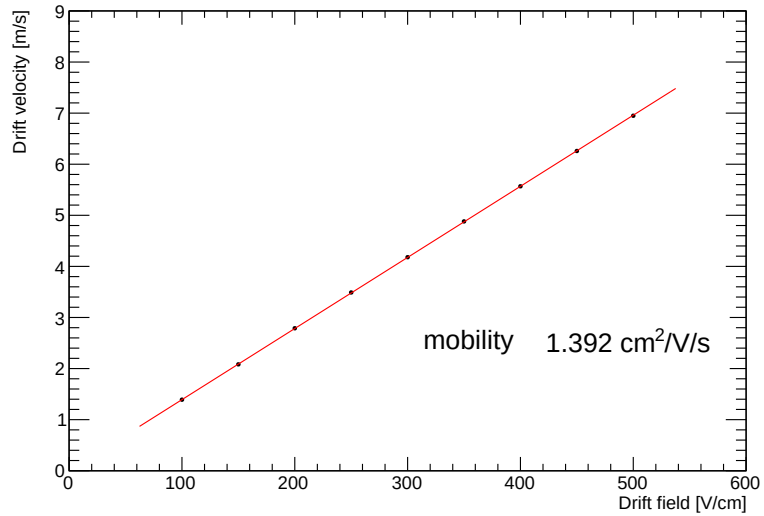




Is this due to the O2 levels rising? and H2O?

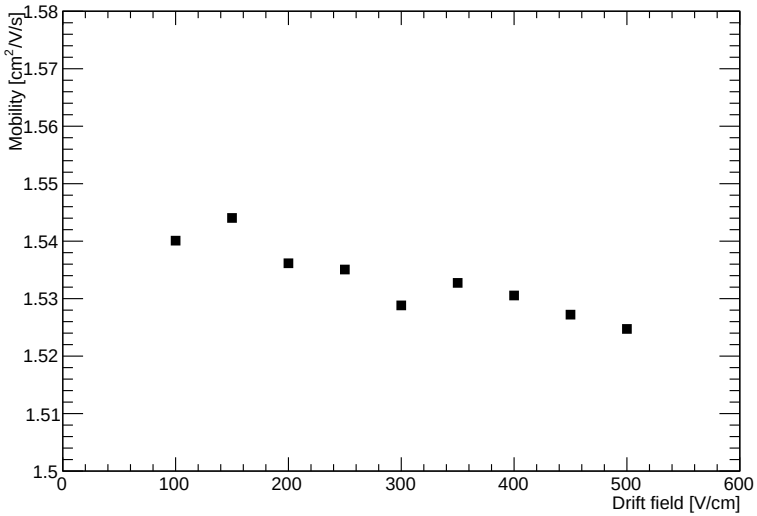
Mobility

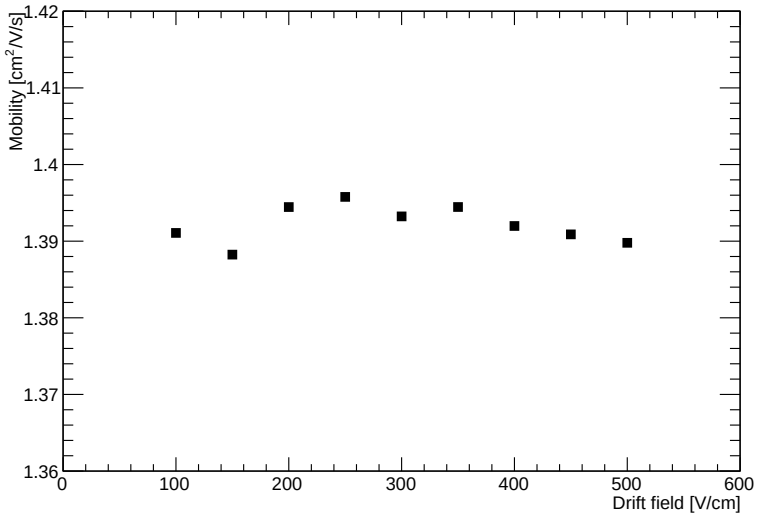




Difference between runs 1043 – 1051 and 1065 – 1073

Mobility

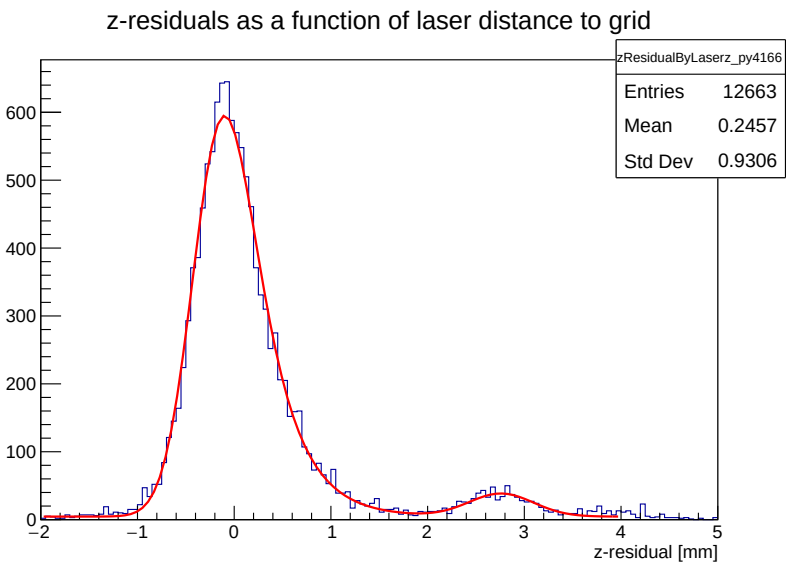


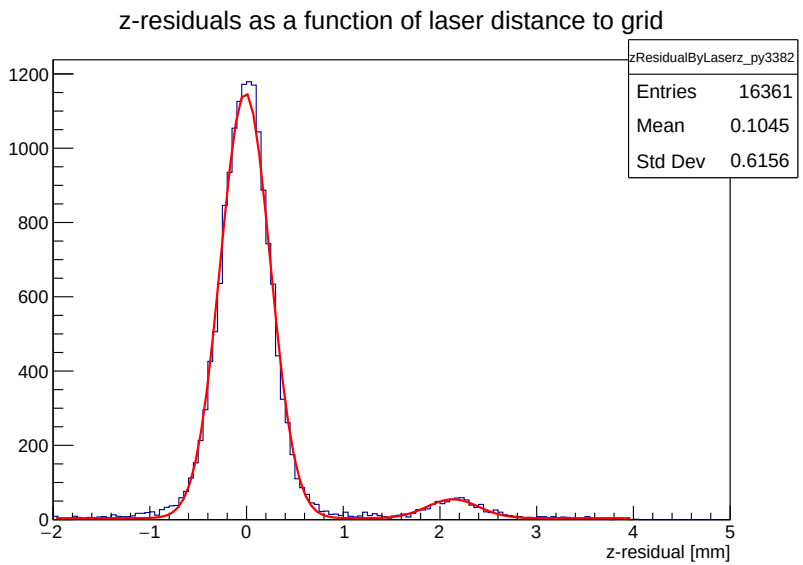


But does not rise over runs, so little dependence on O2 levels? and H2O?

Difference in shape

run 1050 and 1073

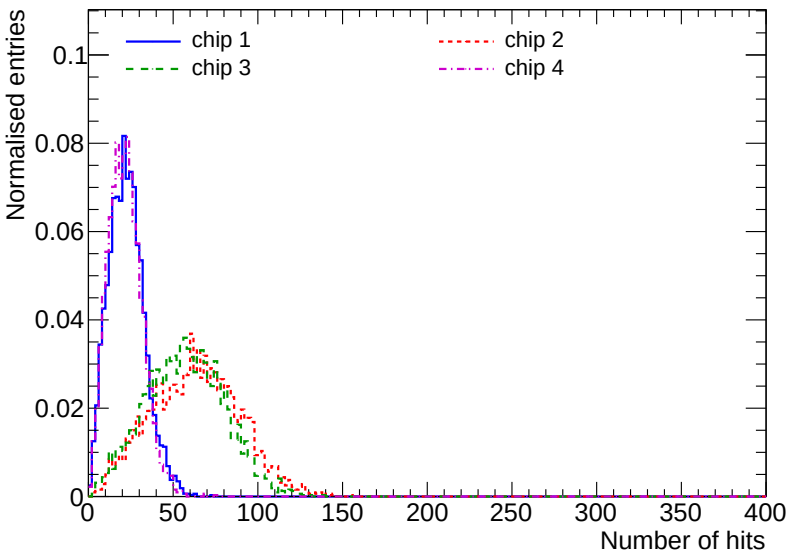


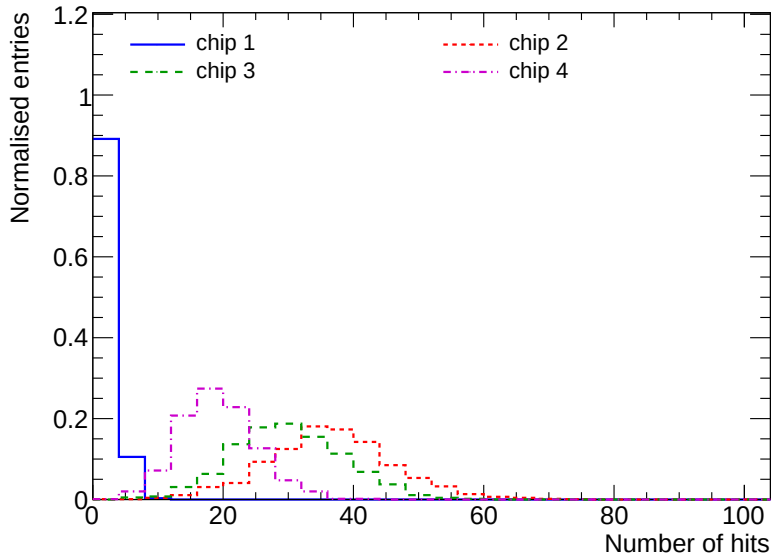


Exponential slope has disappeared in new run?

Frame Title

run 1042 and 1073





Number of hits is slightly higher in second set of runs, but of course tunable

To what should we set the laser intensity?

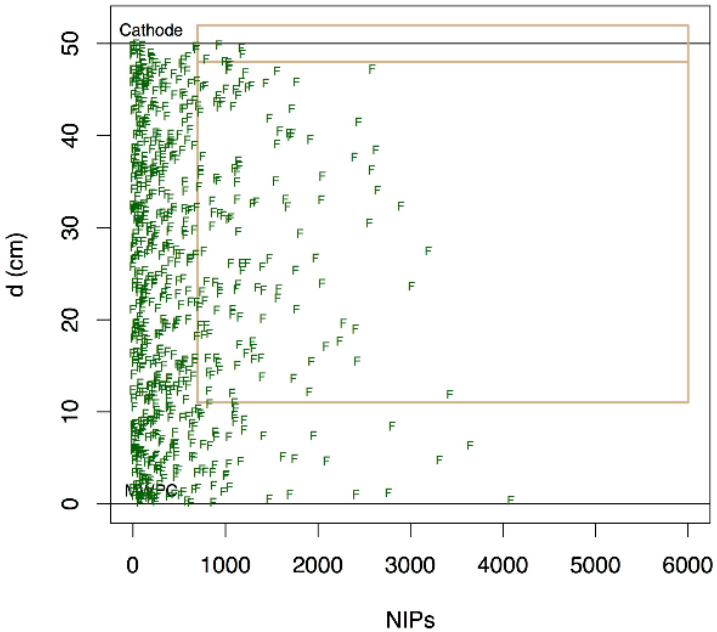
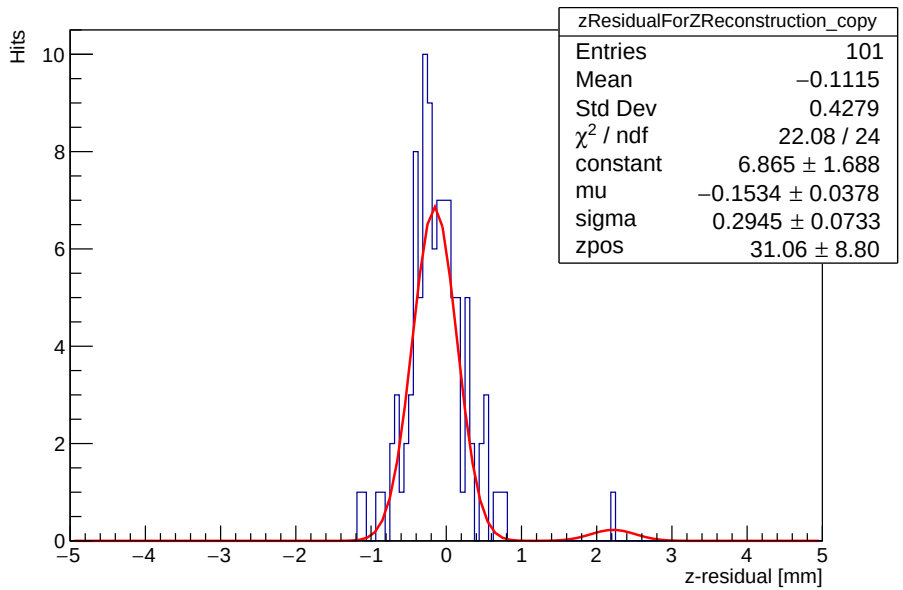


Fig. 10 – Simulated distribution of 700 F recoils from 100 GeV WIMPs in the *d* vs. *NIPs* space.

Drift IId looks from 700 pairs and up, but this seems like a detector limit
Most WIMP recoil would deposit only a few keV in the detector
https://arxiv.org/ftp/arxiv/papers/1701/1701.00171.pdf

First attempt at reconstructing z

Try to reconstruct the z position of 35 mm using a fit of two Gaussians



We should use more hits to accurately reconstruct the z-position