



Tracker Reconstruction Status

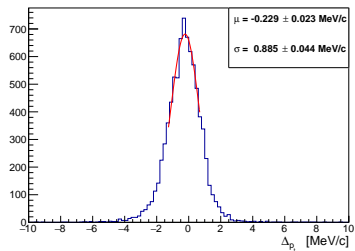
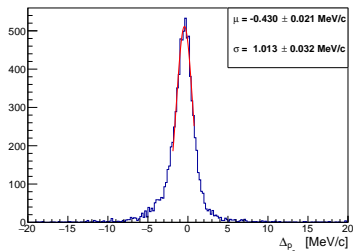
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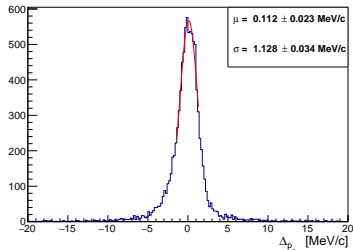
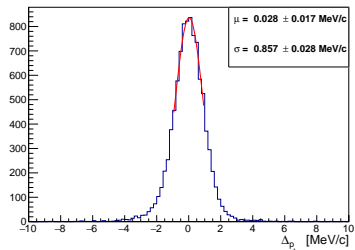
MICE VC, 6th April 2017



TkUS

 p_t  p_z 

TkDS



Efficiency Methodology

- Efficiency here is analysed for Pattern Recognition specifically
- Using real data we look for events where a good 5 point track is expected:
 - 1 spacepoint only in both TOF1 and TOF2;
 - muonic time-of-flight;
 - exclude events with enough spacepoints to form 2 or more tracks;
 - optionally further require 1 spacepoint and 1 only in each tracker station (“ideal events”);
 - each tracker is looked at independently of the other.
- Code available in MAUS:

```
bin/scifi/pat_rec_efficiency.py maus_output.root
```



Progress

- Real data, run 8681
- Ideal event cuts

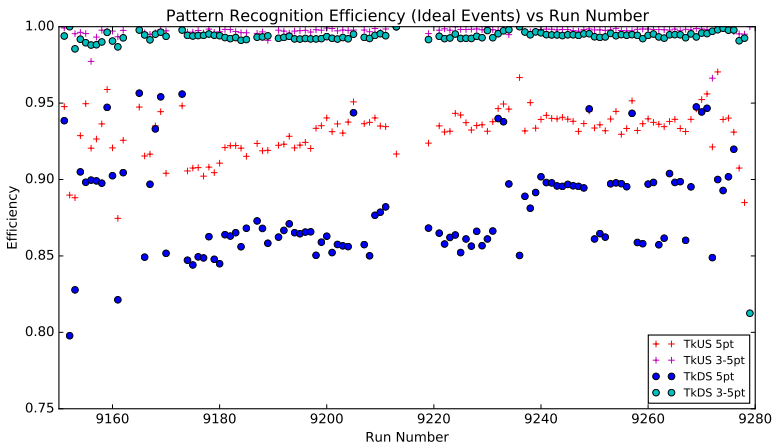
Version	TkUS 5pt	TkUS 4-5pt	TkDS 5pt	TkDS 4-5pt
2.6.5	0.5774	0.9141	0.3954	0.827
2.7.0	0.8754	0.9912	0.7625	0.9723
2.8.3	0.9272	0.9986	0.8452	0.9951

Efficiency results

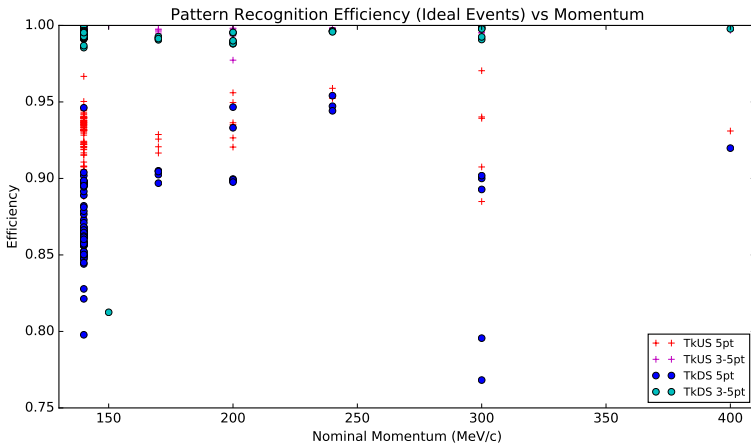


Efficiency vs Run Number

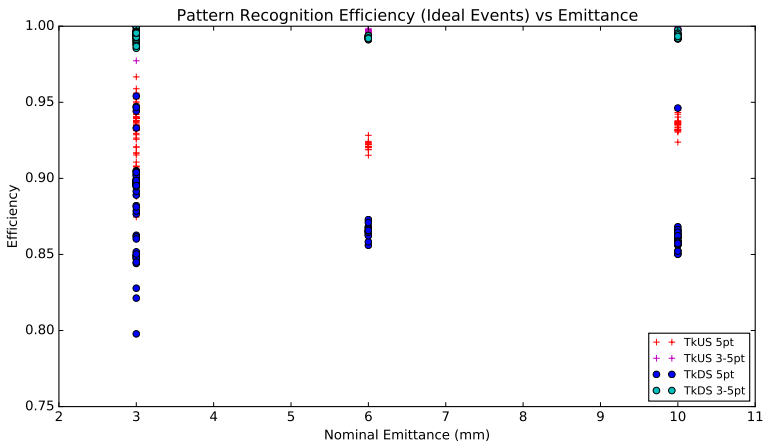
MAUS v2.8, ideal events



Efficiency vs Momentum



Efficiency vs emittance



Next Steps

- MINUIT-based circle fit - initial results show no increase in performance over our custom χ^2 fit, but needs further evaluation
- Implement a missing spacepoint search algorithm - if 4 point track found, check the missing the empty station for an unused spacepoint, and add if it close enough to the track
- Consider changing track model to avoid singularity at $p_t = 0$
- Consider effect of scattering on efficiency

