

# Tracking updates for CPP

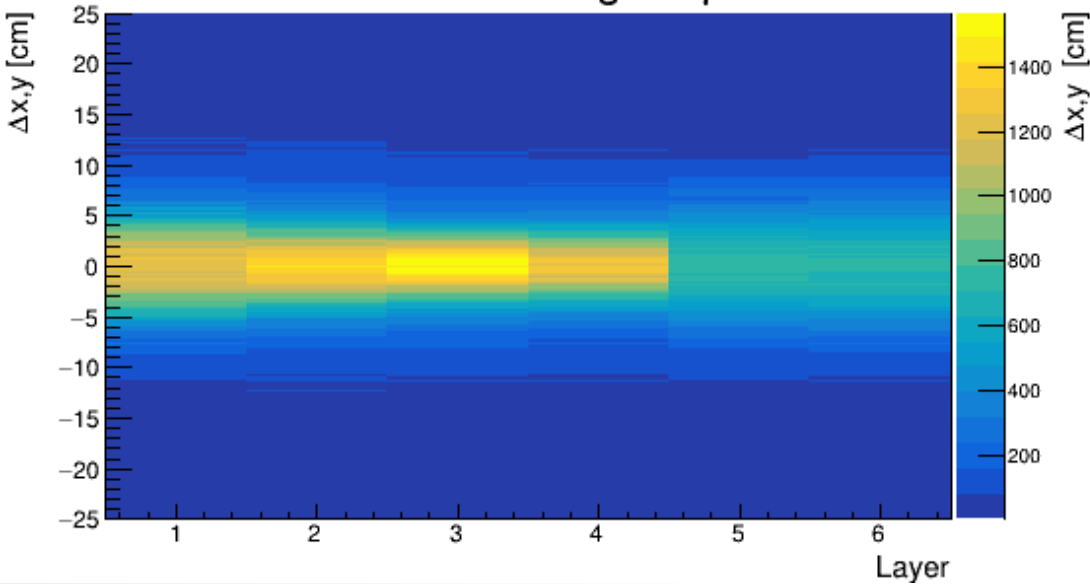
Simon Taylor/JLab

- Track extrapolations to each FMWPC plane added to Kalman Filter code
  - Reads plane positions from geometry XML
  - Sample code:

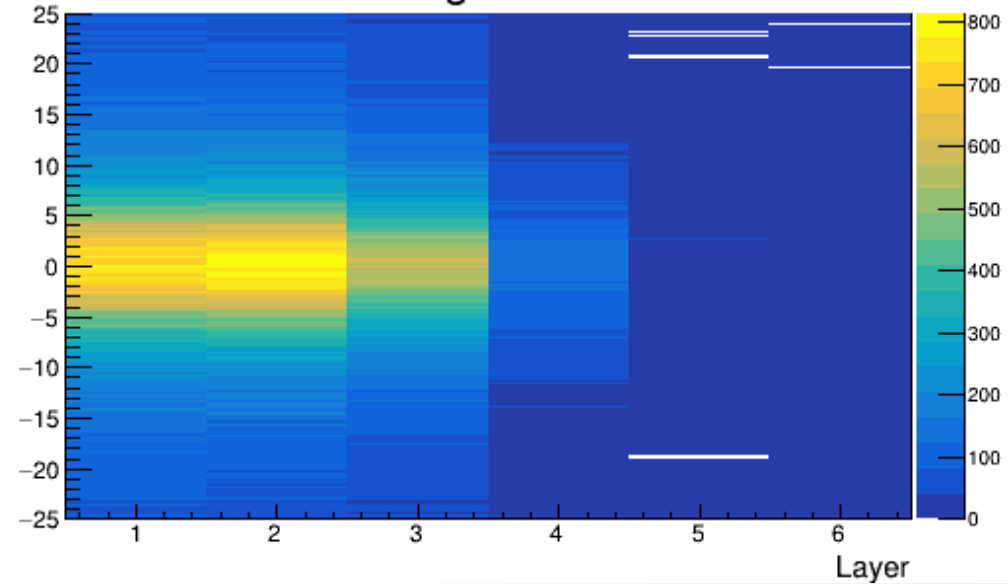
```
vector<DTrackFitter::Extrapolation_t>fmwpc_extraps=track → extrapolations.at(SYS_FMWPC);  
if (fmwpc_extraps.size()>0){  
    DVector3 pos=fmwpc_extraps[0].position;  
    ...  
}
```

# Comparison of muon and pion tracks

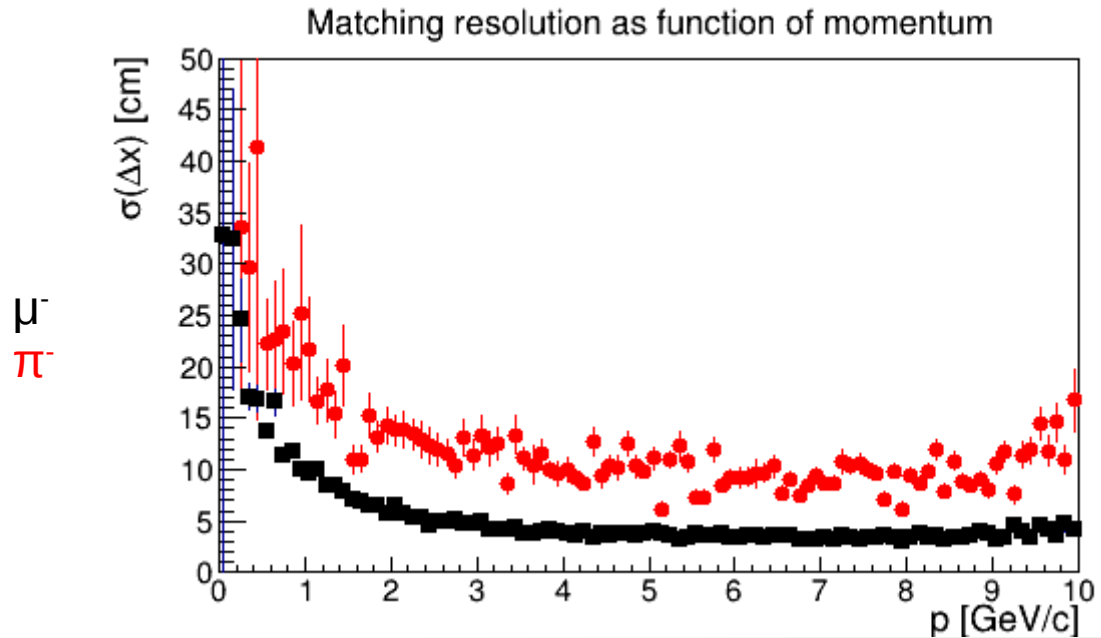
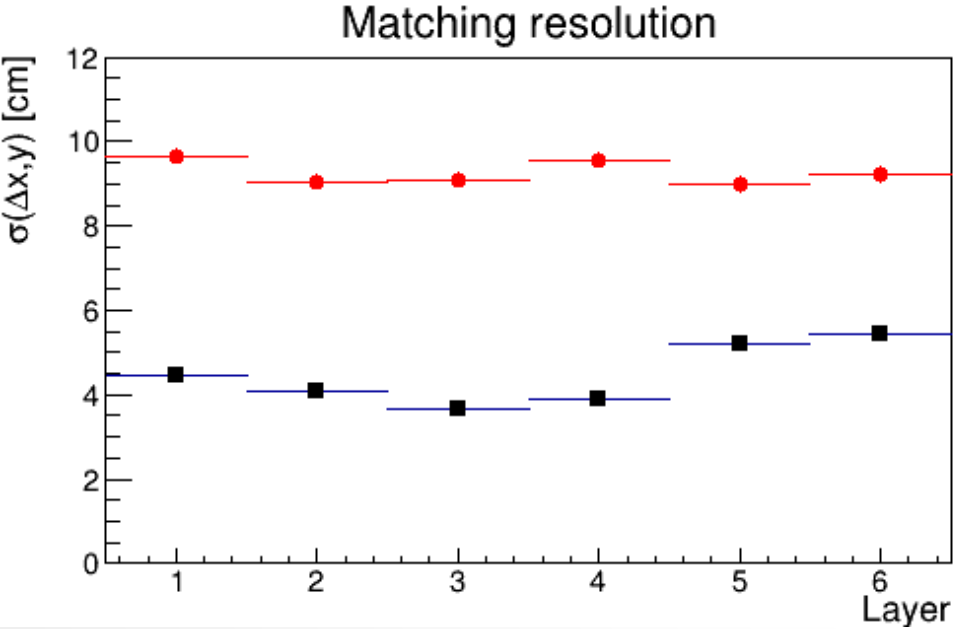
Track matching for  $\mu^-$  at FMWPC



Track matching for  $\pi^-$  at FMWPC



# Comparison of muon and pion tracks



# Track matching to single hits in FCAL

- Github branch:

[https://github.com/JeffersonLab/halld\\_recon/tree/PidFomUpdatesFeb21](https://github.com/JeffersonLab/halld_recon/tree/PidFomUpdatesFeb21)

- Matches single hits in FCAL not associated with clusters
  - Updates to PID library: FCALSingleHitMatchParams
  - Added to REST output:

```
<detectorMatches minOccurs="1" maxOccurs="1" jtag="string">
```

```
...
```

```
  <fcalSingleHitMatchParams maxOccurs="unbounded" minOccurs="0"  
    track="int" ehit="float" thit="float"  
    dx="float" doca="float" pathlength="float" tflight="float" tflightvar="float"  
    tunit="ns" lunit="cm"/>
```

```
...
```

```
</detectorMatches>
```

# Track matching to single hits in FCAL

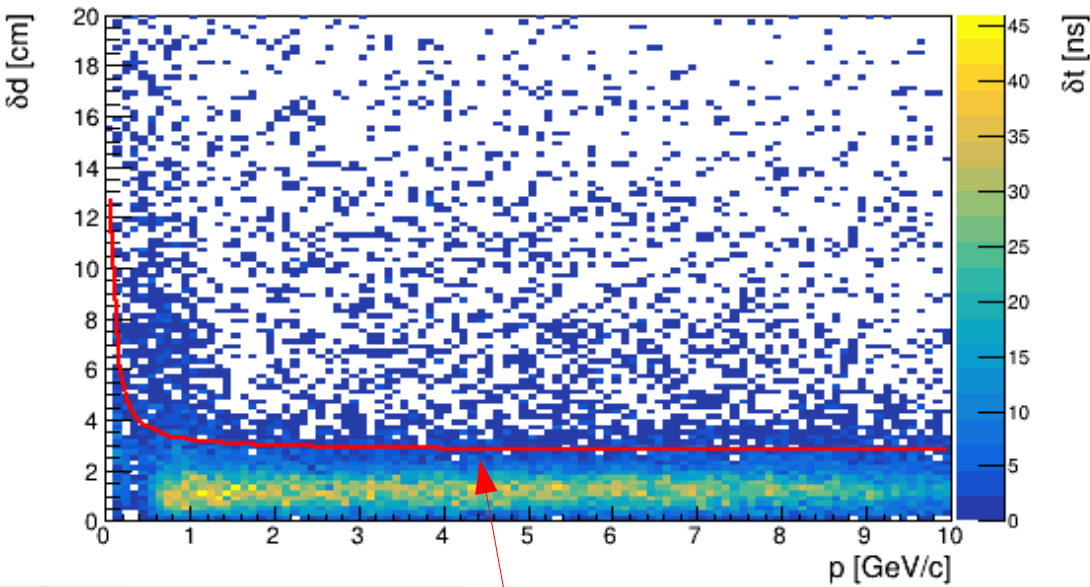
- Added to Analysis tree in ANALYSIS library:
  - "Energy\_FCAL\_SingleHit", "TrackFCAL\_DOCA\_SingleHit"
- Added to DSelector:

*Float\_t Get\_Energy\_FCAL\_SingleHit(void) const;*

*Float\_t Get\_TrackFCAL\_DOCA\_SingleHit(void) const; //999.0 if not matched*

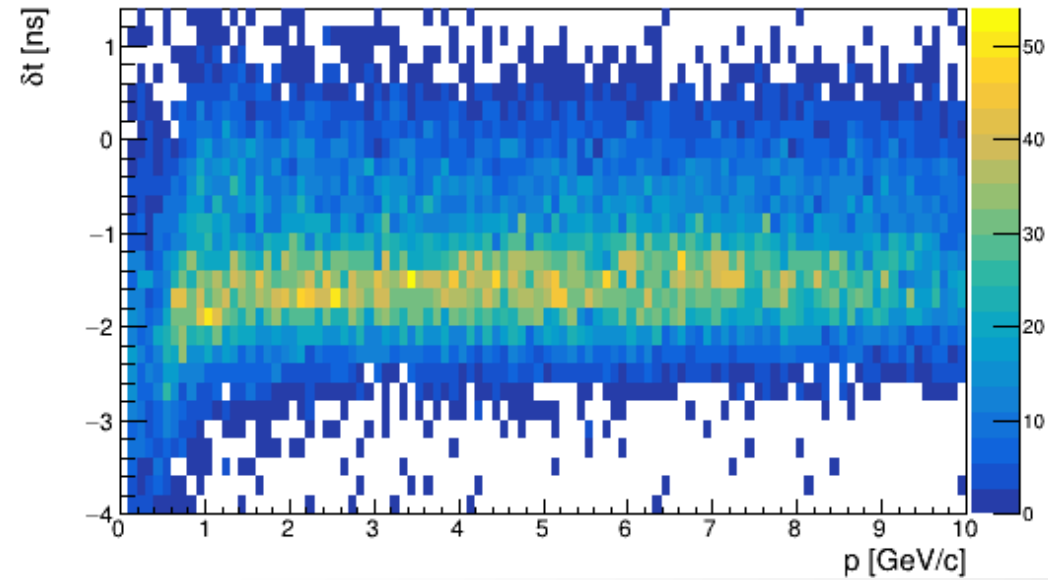
# Track matching to single hits for muons

Matching distance to single hits in FCAL



$$f(p) = 2.75 + 0.5/p$$

dt vs p



# Track matching to single hits for muons

