

Large Pulseheight tracks

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Purpose and Goal

- Find events with hadronic interaction
 - Slow hadrons are highly ionizing
 - search for tracks with large pulseheight hits

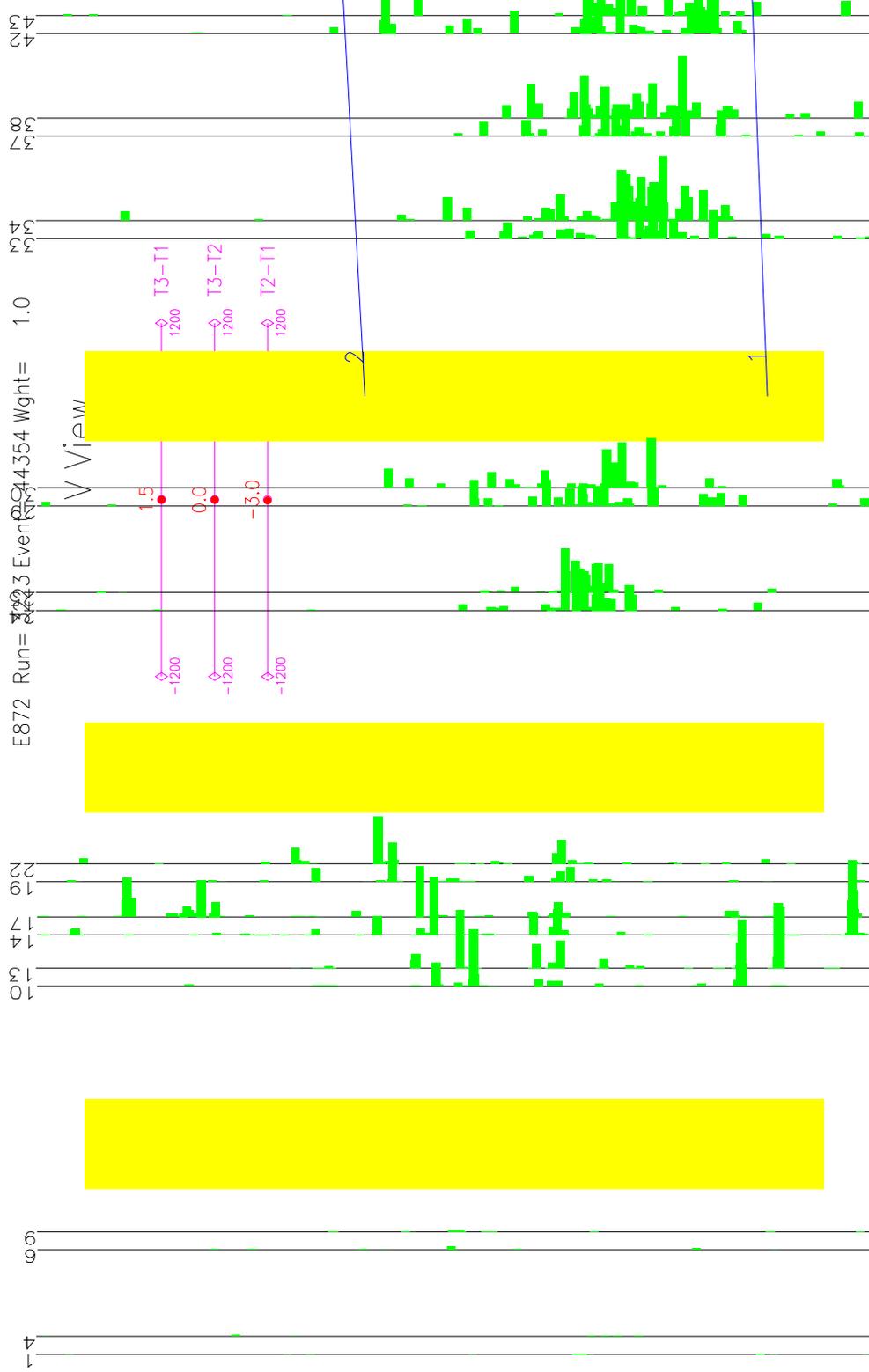
Method

- Find events with large pulseheight hits in consecutive planes in the same view
- calculate the angle with respect to the Z axis (neutrino direction)
- Histogram this angle and compare to MC

Plots

- Two example events
- Bethe-Bloch formula for ionization energy loss
 - ionization is large for $p/Mc < 0.5$
- Histogram of the angle of tracks with pulseheight $> 5 * (\text{muon peak})$

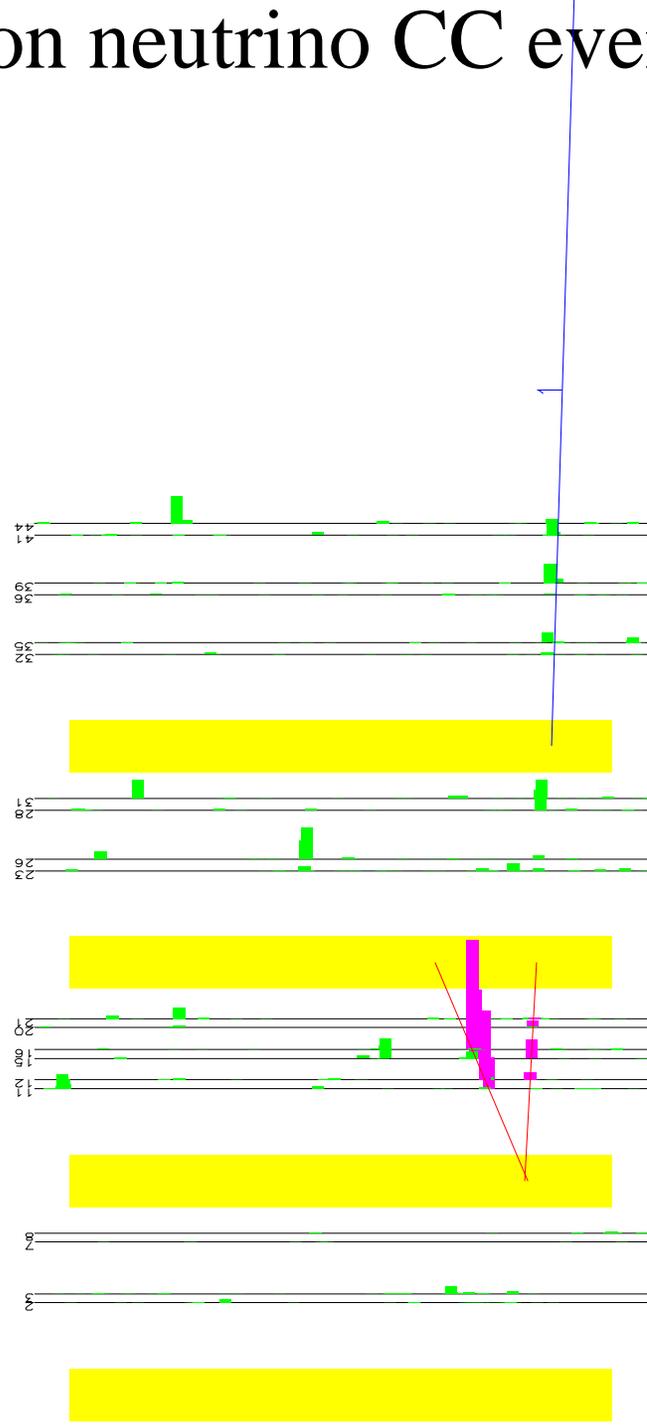
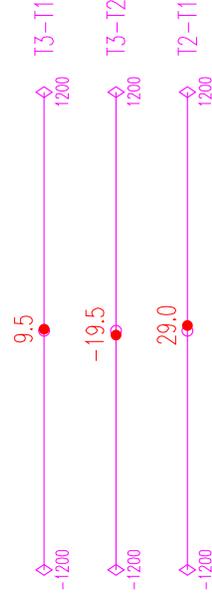
Period 4 event



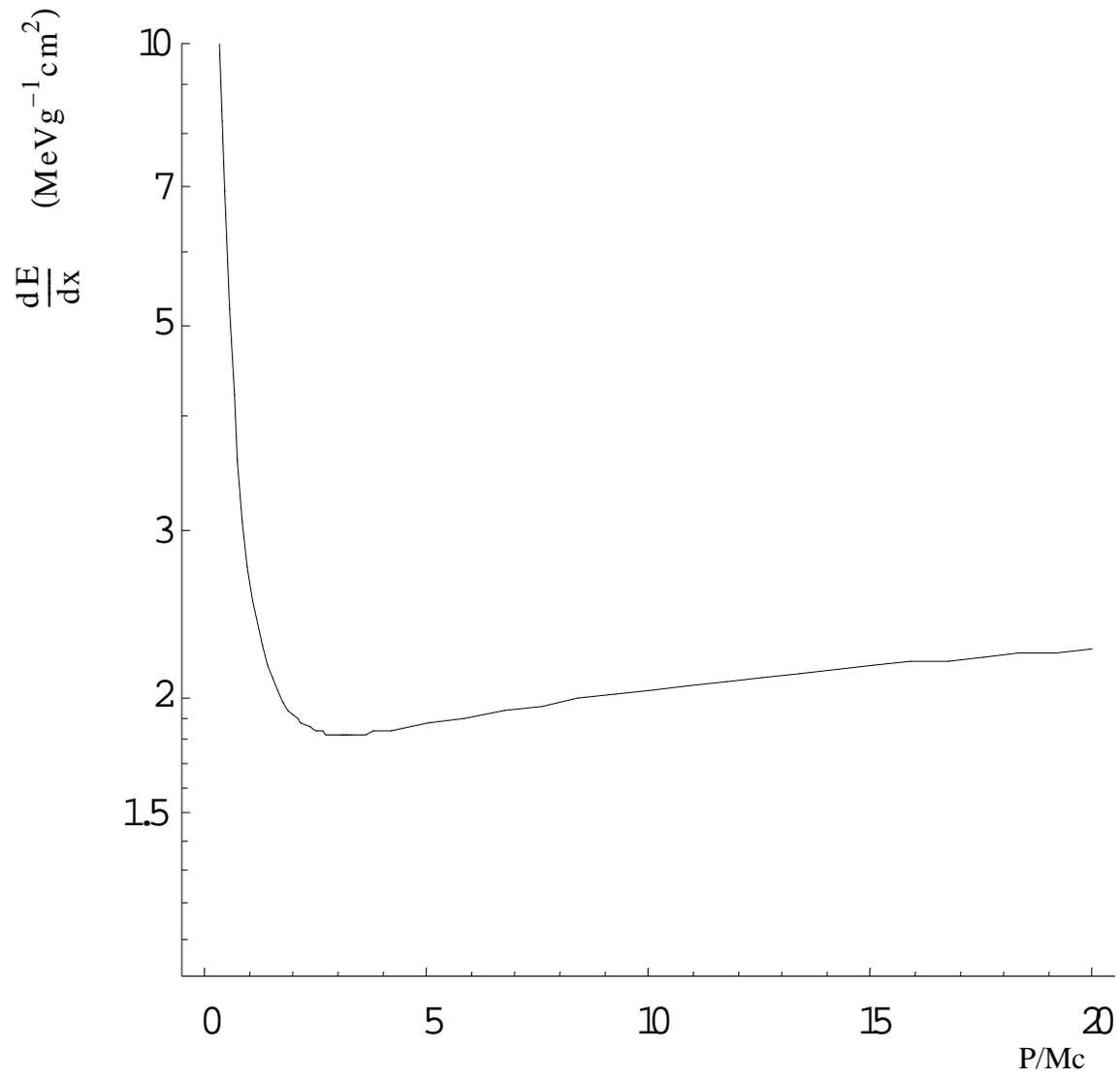
Period 4 muon neutrino CC event

E872 Run= 3222 Event= 46432 Wght= 1.0

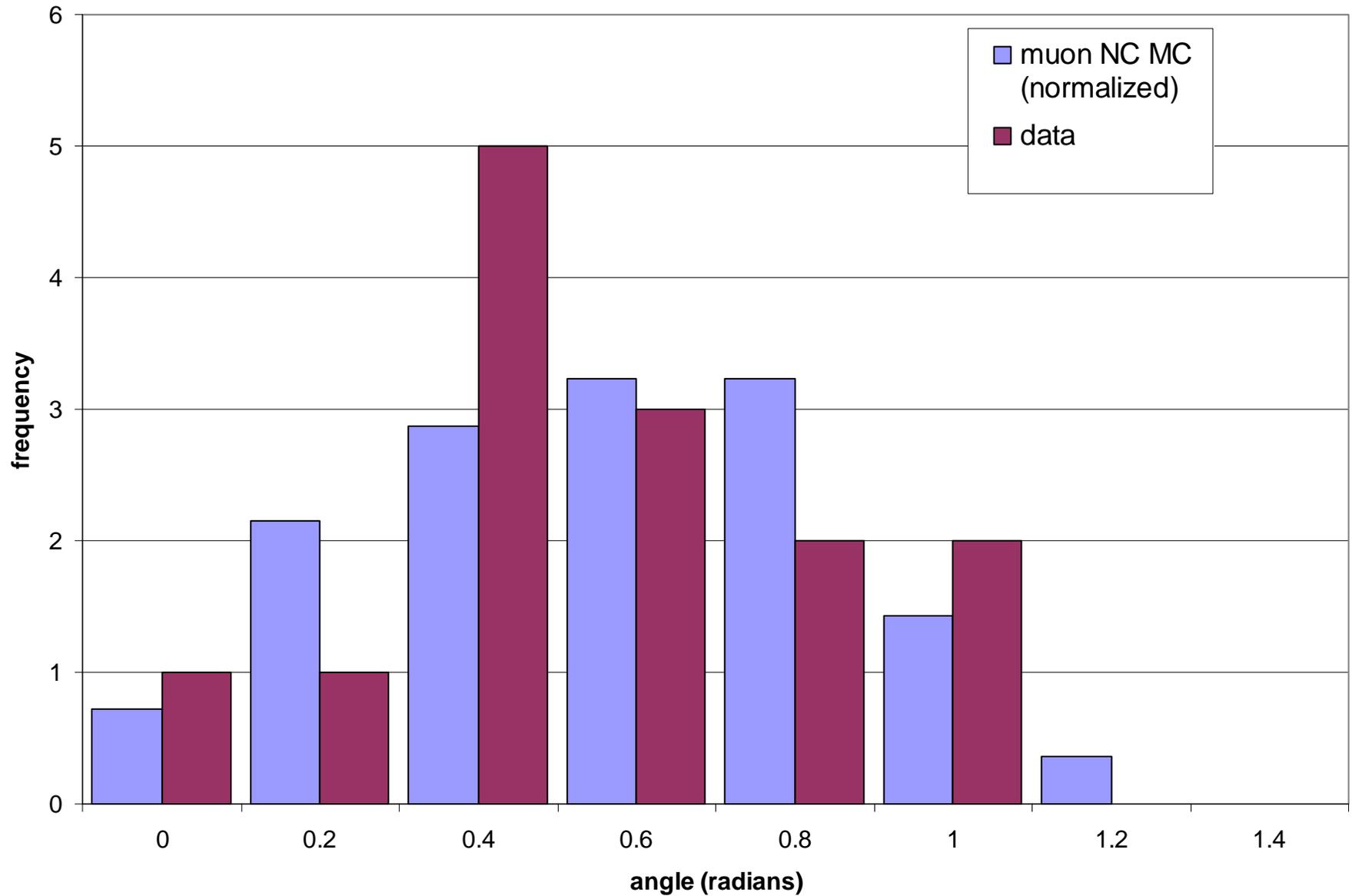
U View



Ionization energy loss (Bethe-Bloch formula)



Histogram of hadron angle



Results

- The angular distribution is consistent with tracks coming from the emulsion
- The MC reproduces the large pulseheight tracks well
 - Pions and protons produce these tracks
 - they are emitted at large angles

Conclusion and Outlook

- Some events have large angle large pulseheight tracks
- The Monte Carlo can reproduce these, they are slow pions and protons
- These events can be ignored in an analysis that searches for purely electromagnetic interactions (like mine)
- I will use this analysis in my thesis