

# Global Track Reconstruction

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# Global Track Reconstruction

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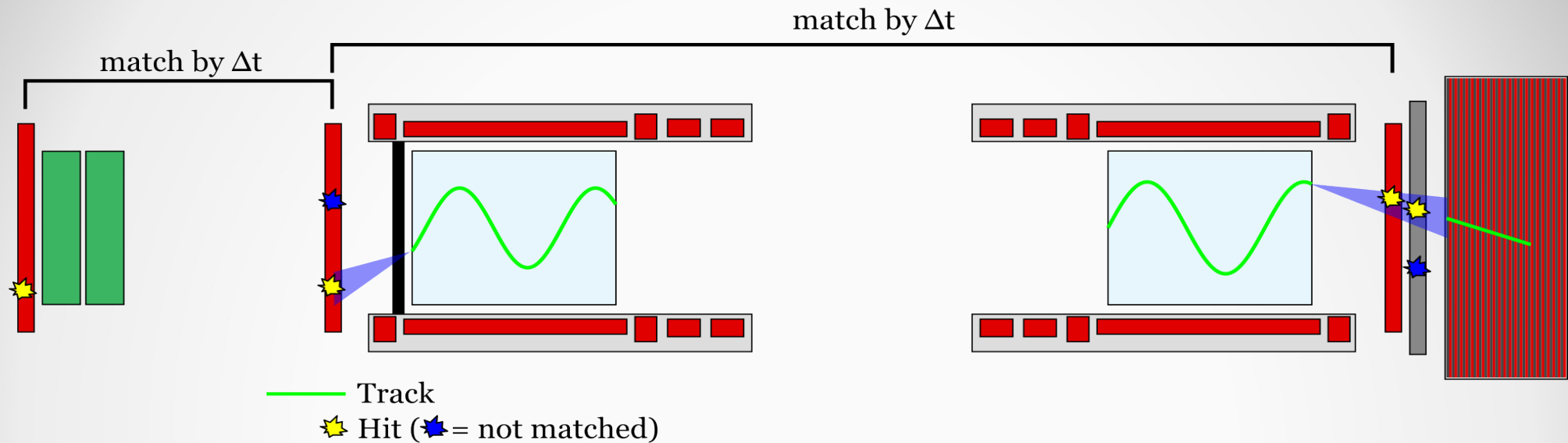
- Track Matching – Determine which detector hits belong to the same track and combine them so that PID (and later analysis) can be run on them
- Track Fitting – Improve the matched trackpoints using information from all detectors as well as provide the possibility of inter- and extrapolation to uninstrumented sections of the beamline

# Track Matching

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- Propagate track point between detectors
- Compare agreement between propagated and measured track point
- → Accept / Reject
- Different method ( $\Delta t$  based) for TOF0 and US/DS matching

# Track Matching

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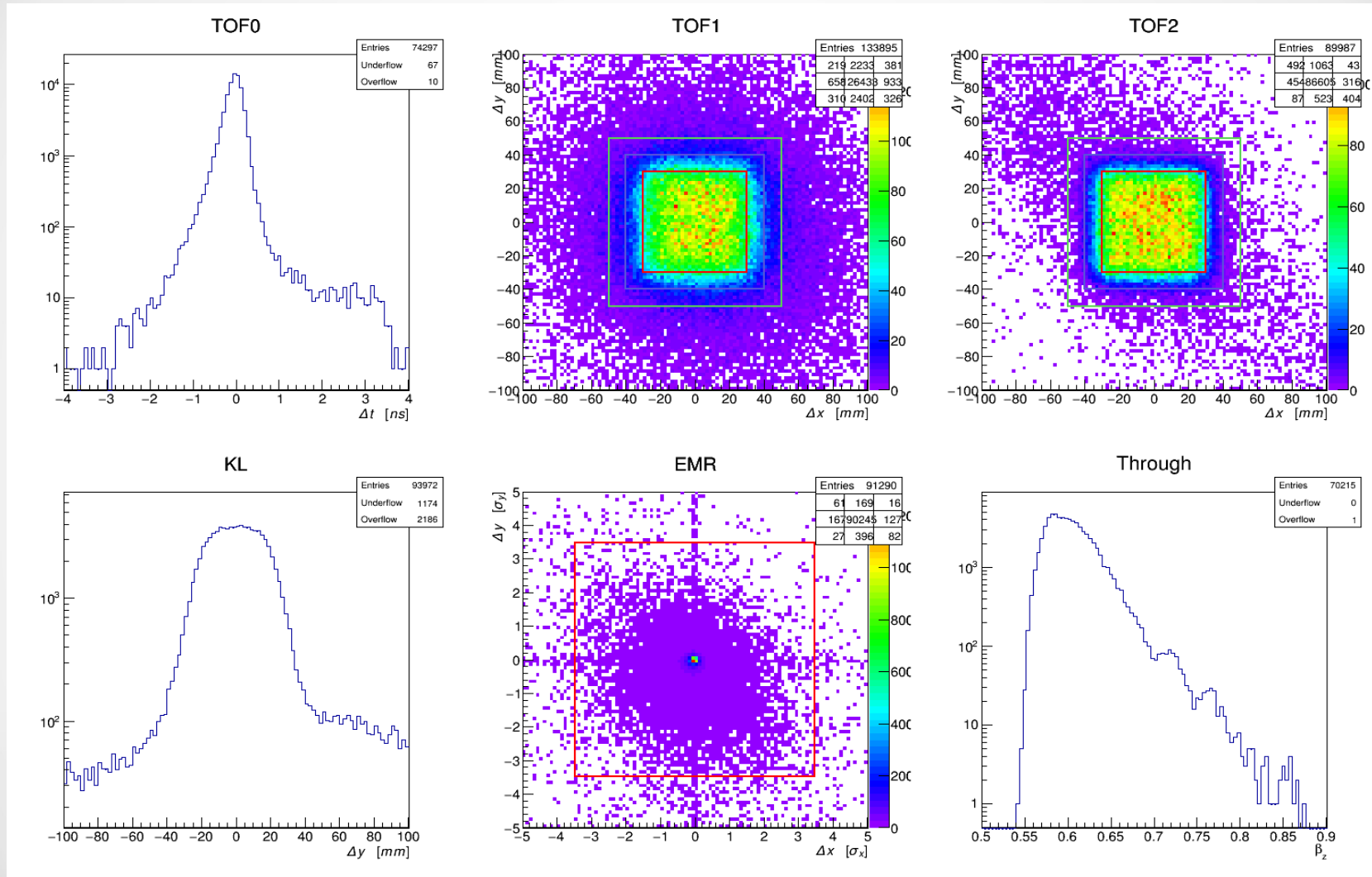
- Propagation requires mass and charge to be known, so track matching creates 3 or 6 tracks for each particle tagged with a PID hypothesis. Celeste's PID code then picks out the correct one

# MC Residuals (Geometry 115)

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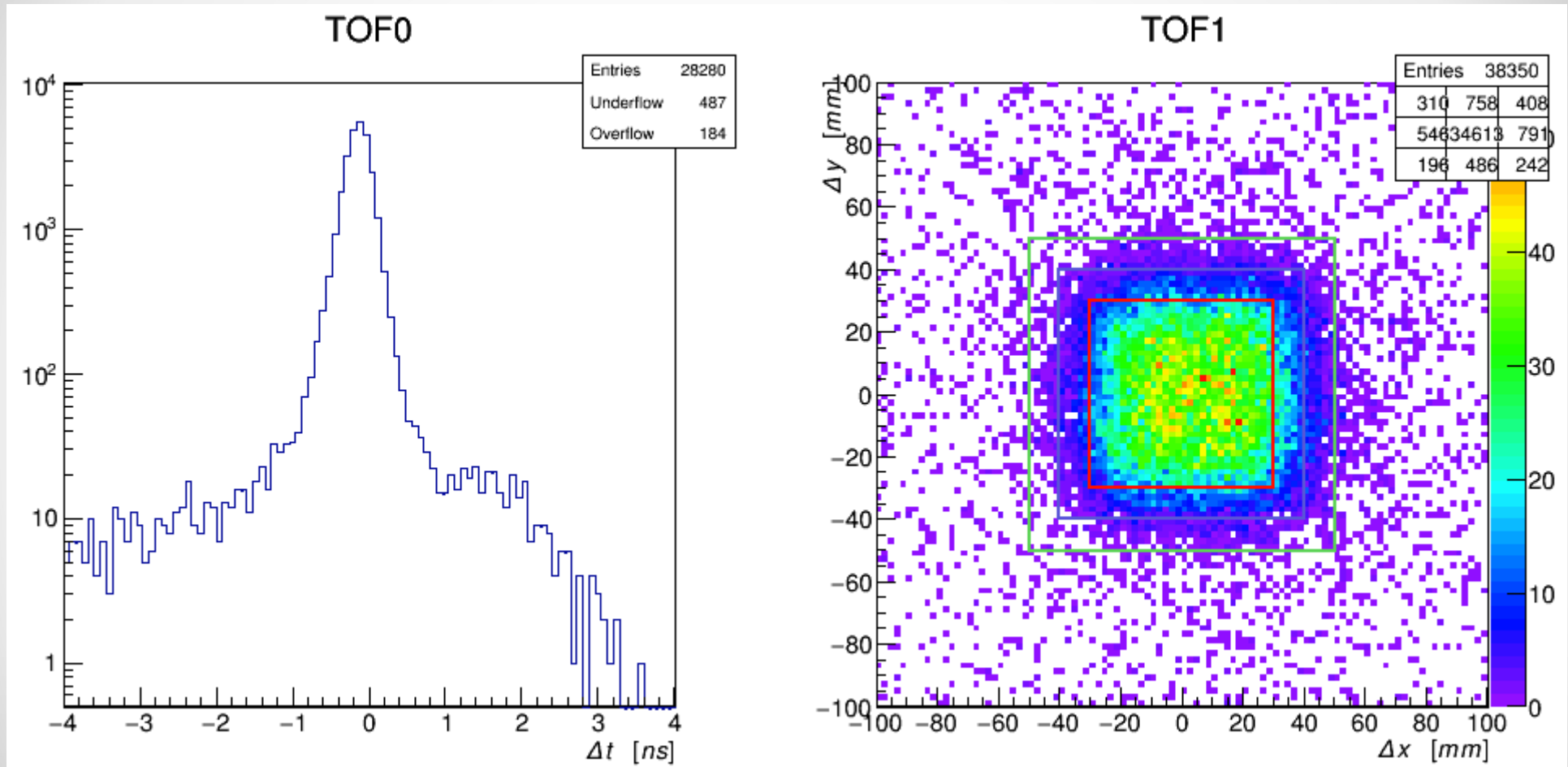


# Data Residuals (Run 7469)

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# Performance Improvements

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- No repeated propagation to different detectors on same side of cooling channel
- Only use propagation if any detector in the section (US or DS) has more than one space point, otherwise assume match
- Together, roughly an order of magnitude performance increase, as well as increase in efficiency

# TrefArray Issues

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- Discovered an issue with the ROOT data importer and/or the global data structure which results in a failure to import global tracks with trackpoints into MAUS. Work in progress, for the time being workaround on MICEmine.  
(<http://micewww.pp.rl.ac.uk/projects/globals/wiki/TempWorkaround>)

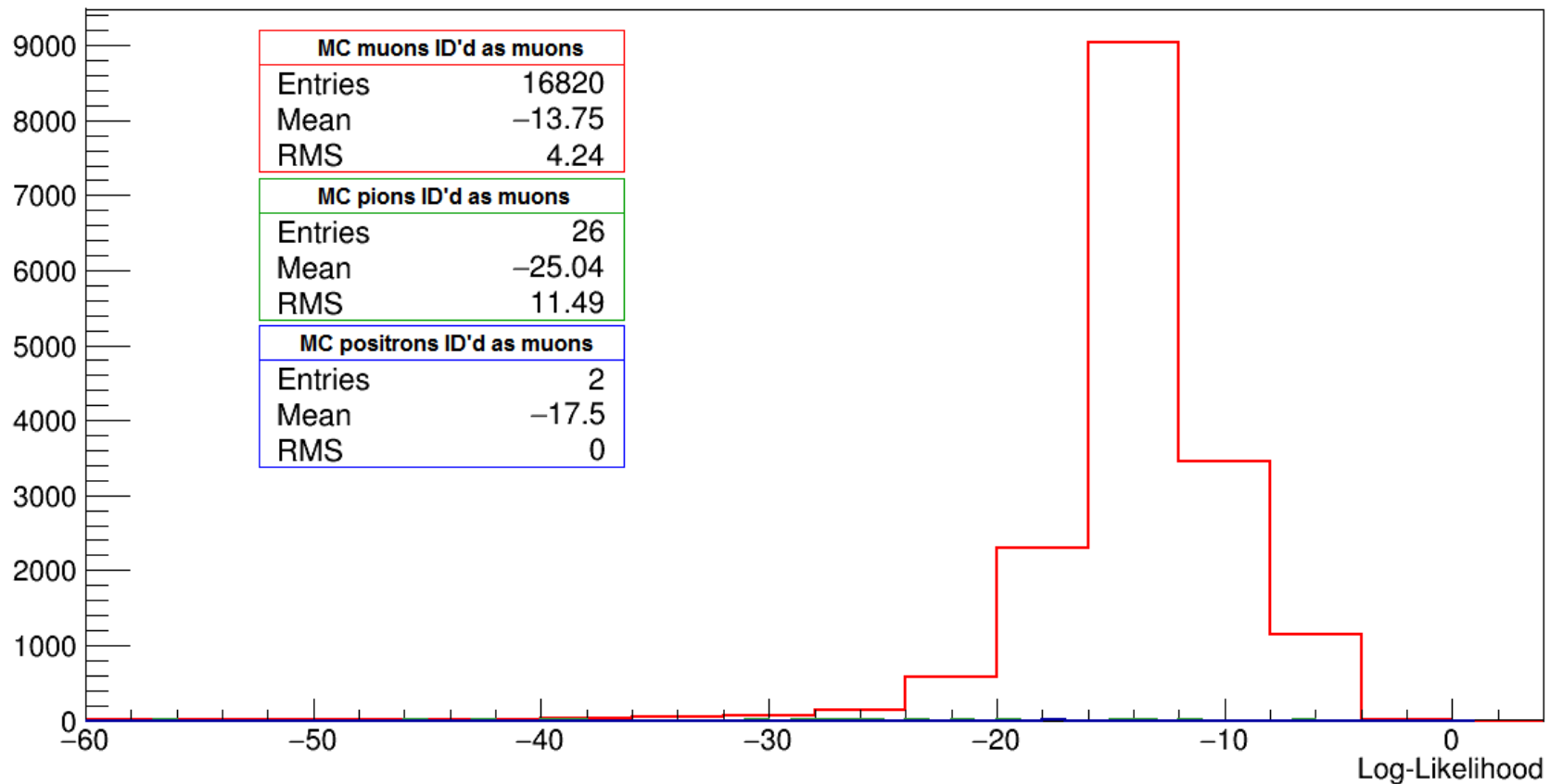


# PID

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# PID

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# Future Work

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- Once TrefArray issue is fixed, include track matching and PID in standard unpacking script
- Track Fitting: Chris Rogers has been doing some work on this in the meantime, fit this into the current data flow and work from there.