Characterization and Subtraction of Timing Accidental TAGM Background Contamination in π^0 Yield

Dustin McNulty
PrimEx Collaboration
MIT/Jlab
mcnulty@jlab.org

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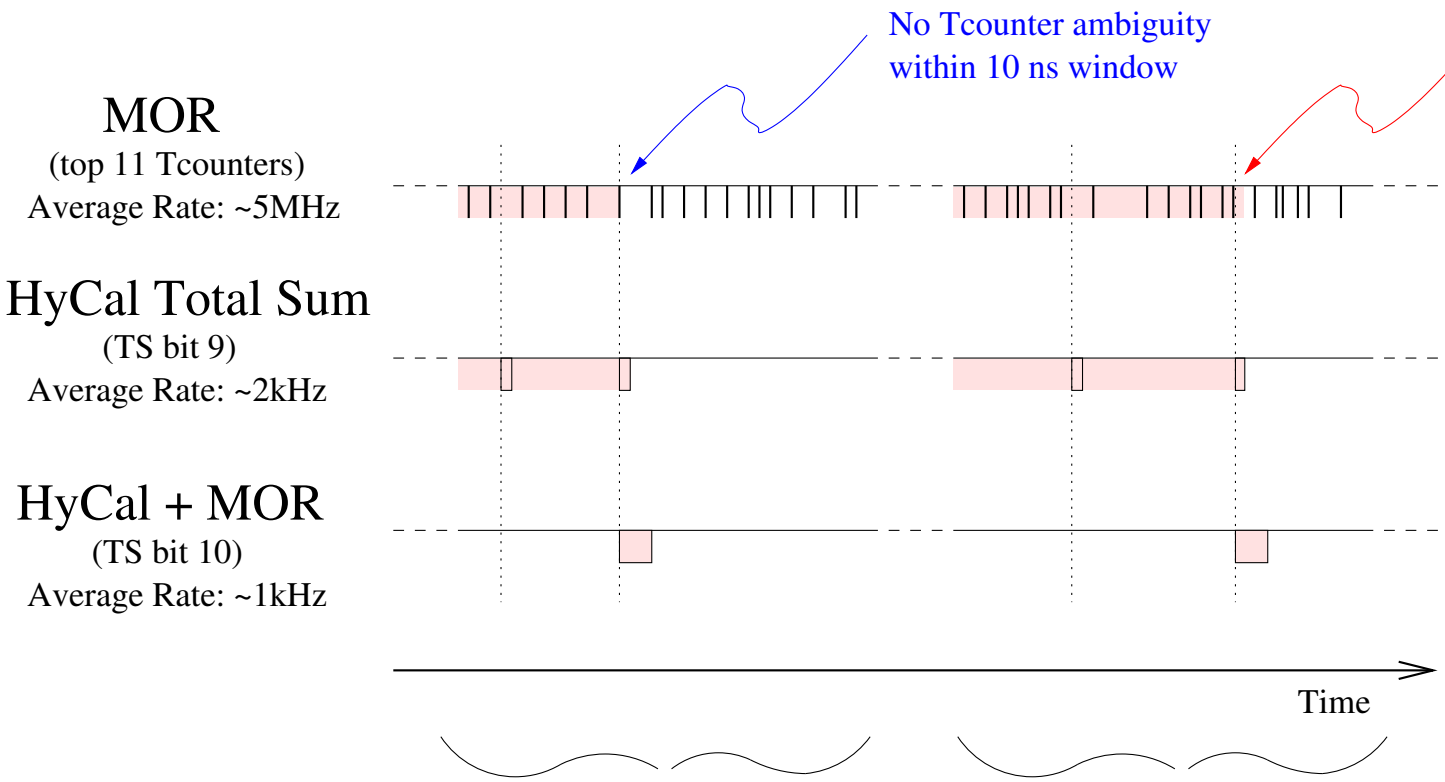
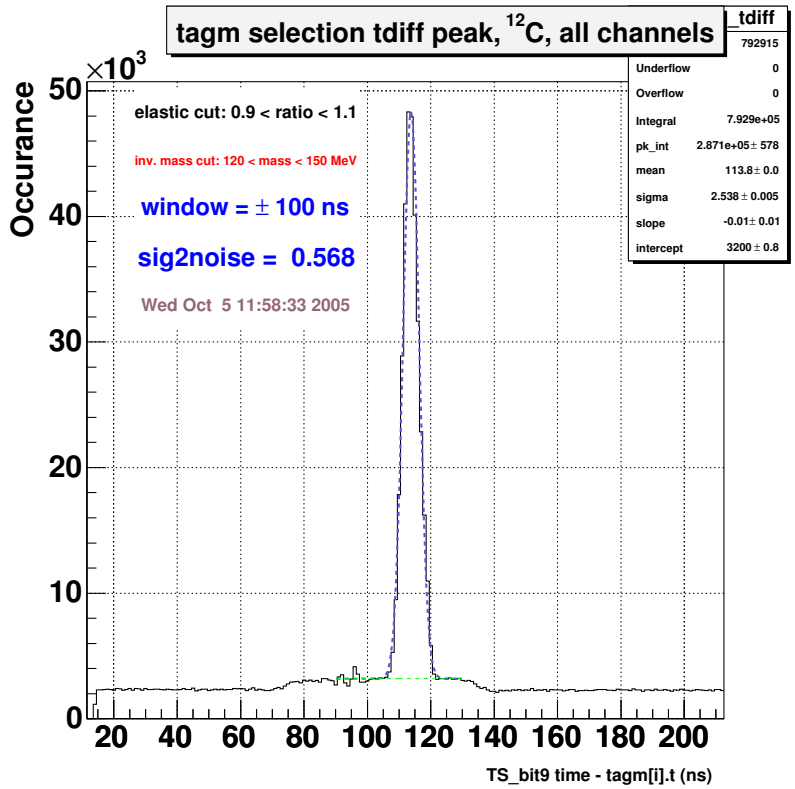
Basis for Accidental Timing Background

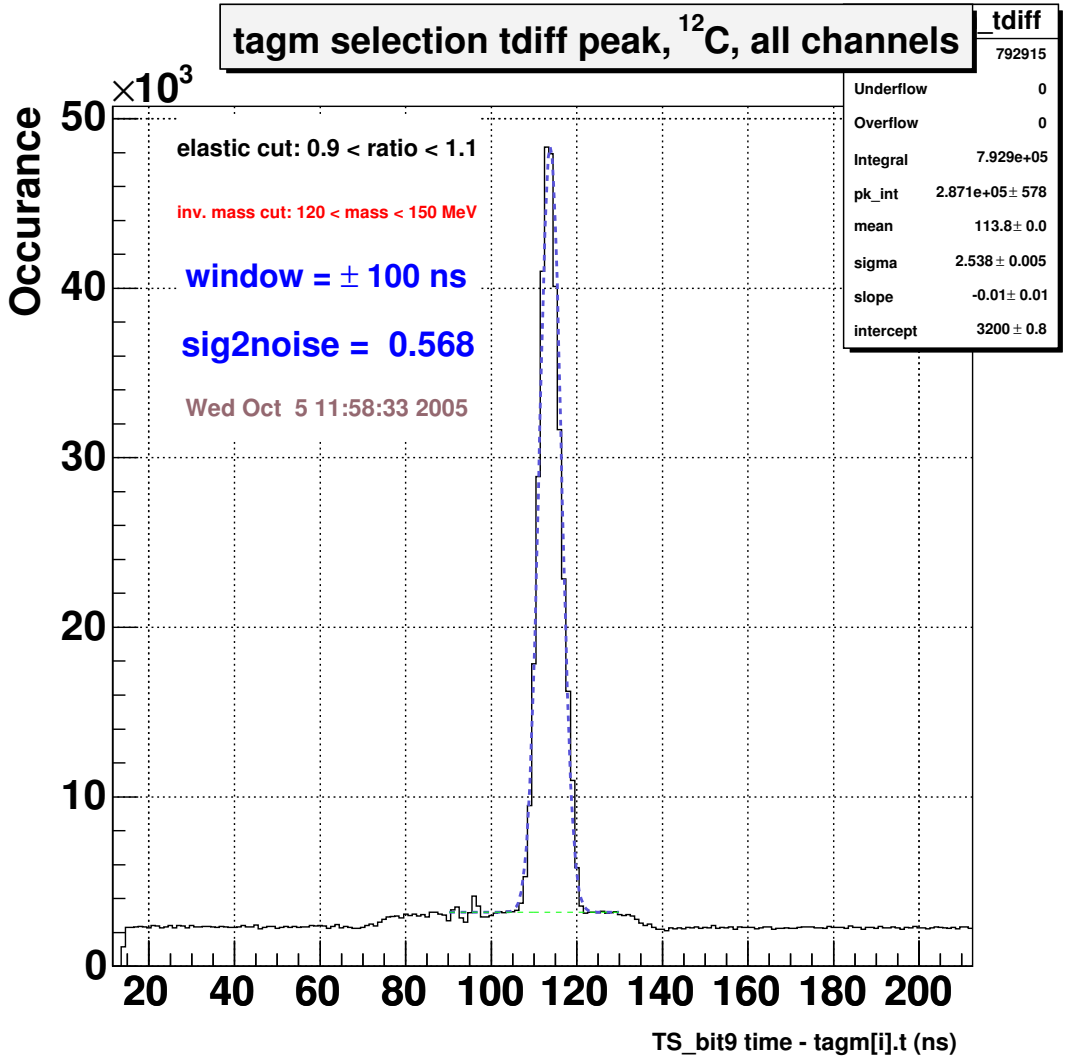


TAGM selection

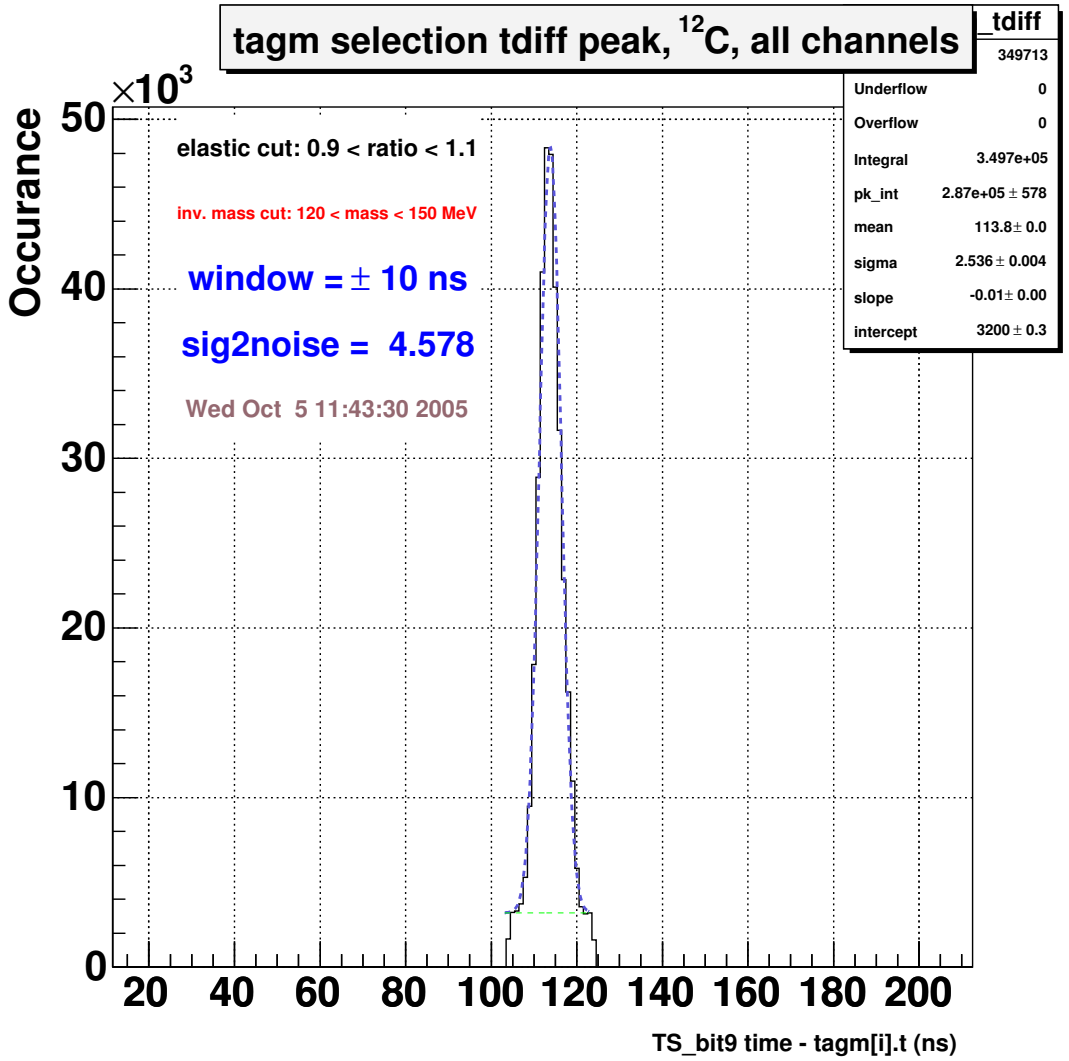
- For each event, a list of TAGM candidates is compiled.
- Candidates are added to the list if the difference between their time and the readout-correlated TS bit 9 event time is equal to the peak time difference within some timing window (say for example ± 30 ns).



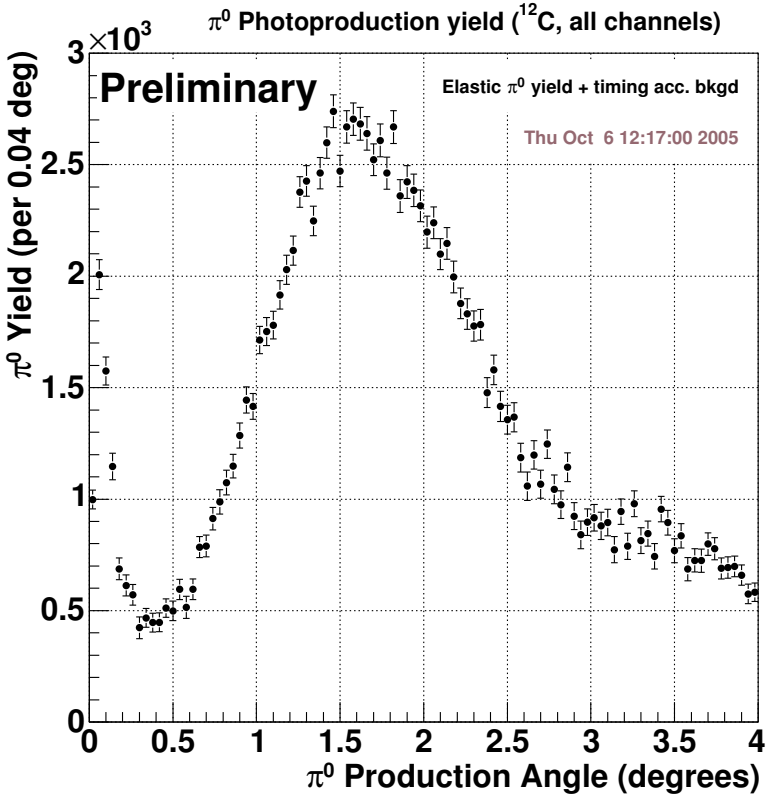
TAGM selection: Peak time difference

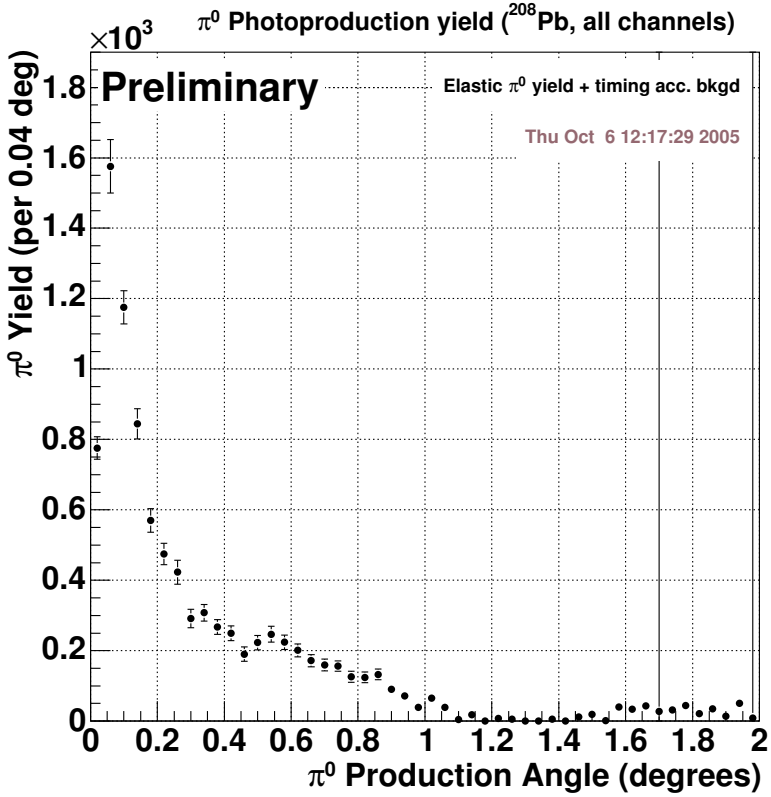


Candidates passed through 'in-time' π^0 yield analysis



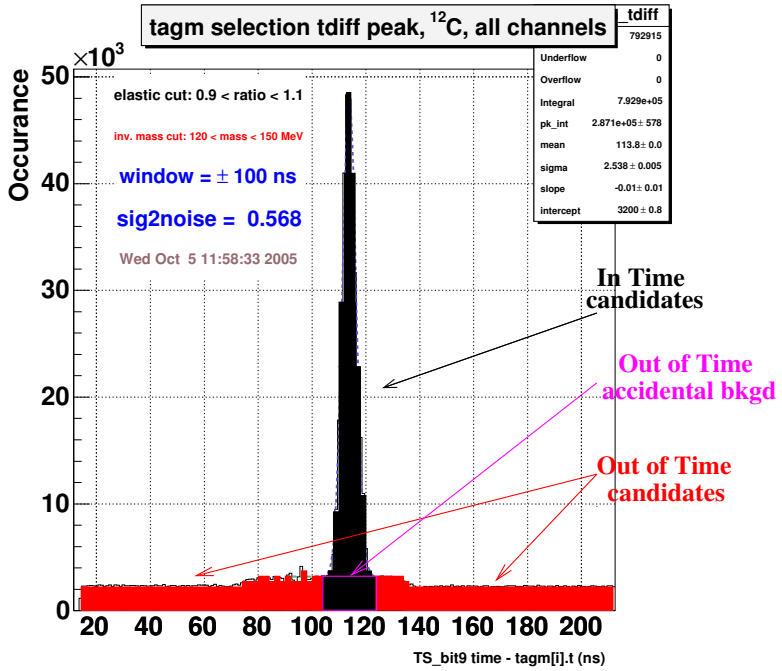
'In-time' Elastic π^0 yields with ± 10 ns time window



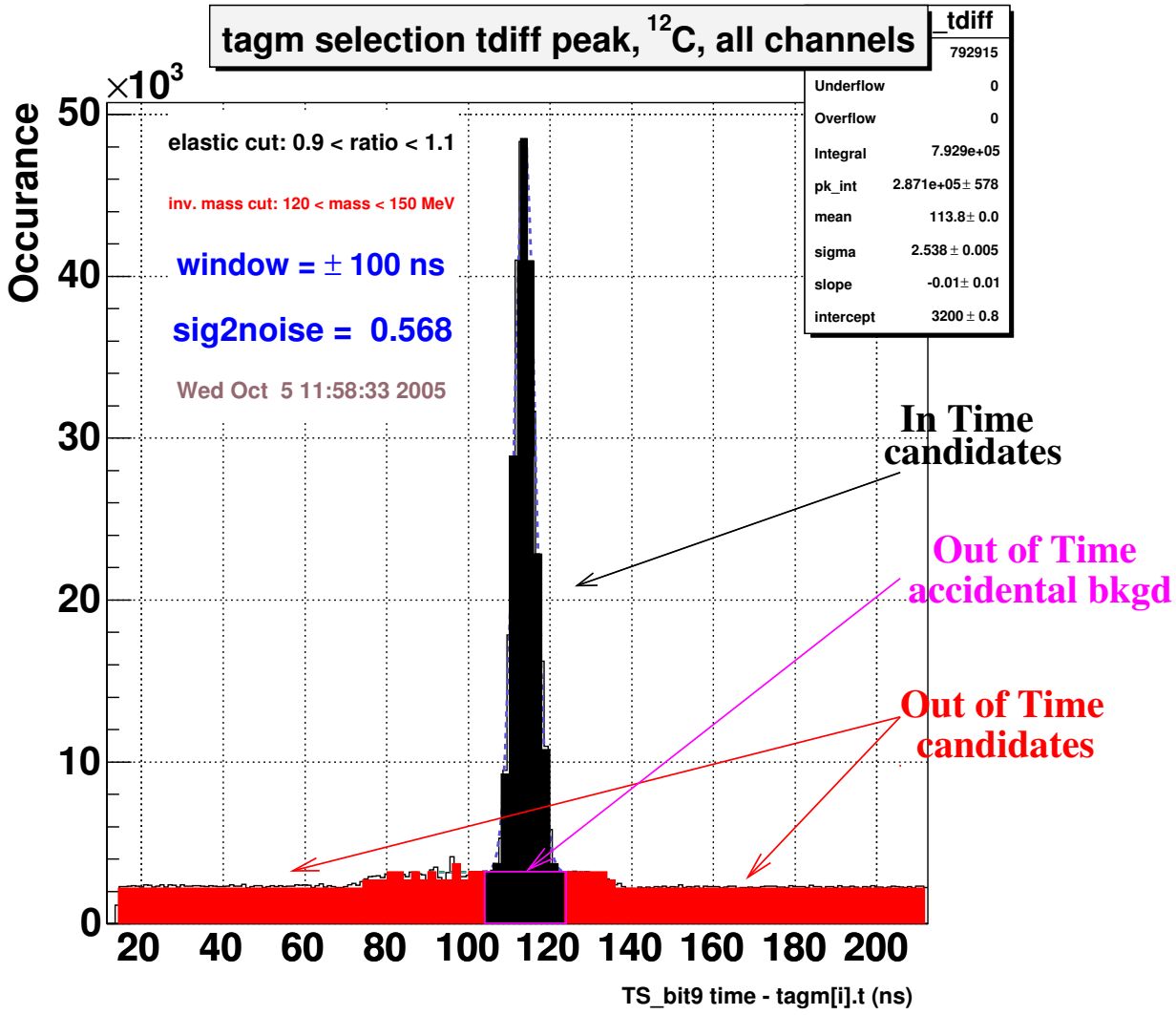


Subtraction of Accidental Timing Bkgd

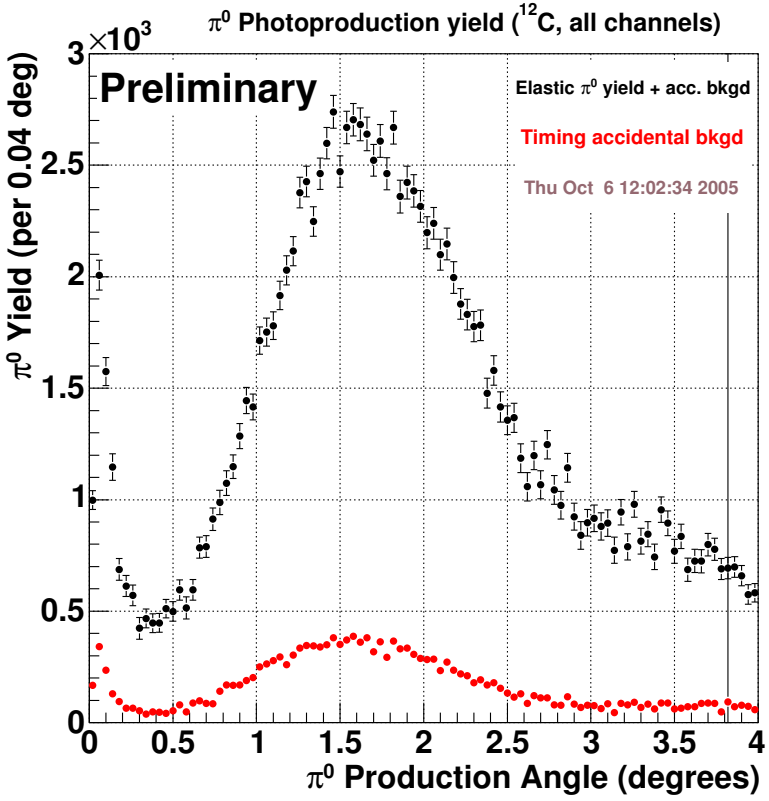
- First identify and quantify bkgd contamination (ratio of signal to noise for ± 10 ns cut is ≈ 4.6 1)
- Second, use out-of-time candidates to characterize the shape of bkgd.
- Third, scale the out-of-time spectra to the proportionate size and subtract it from in-time yield.

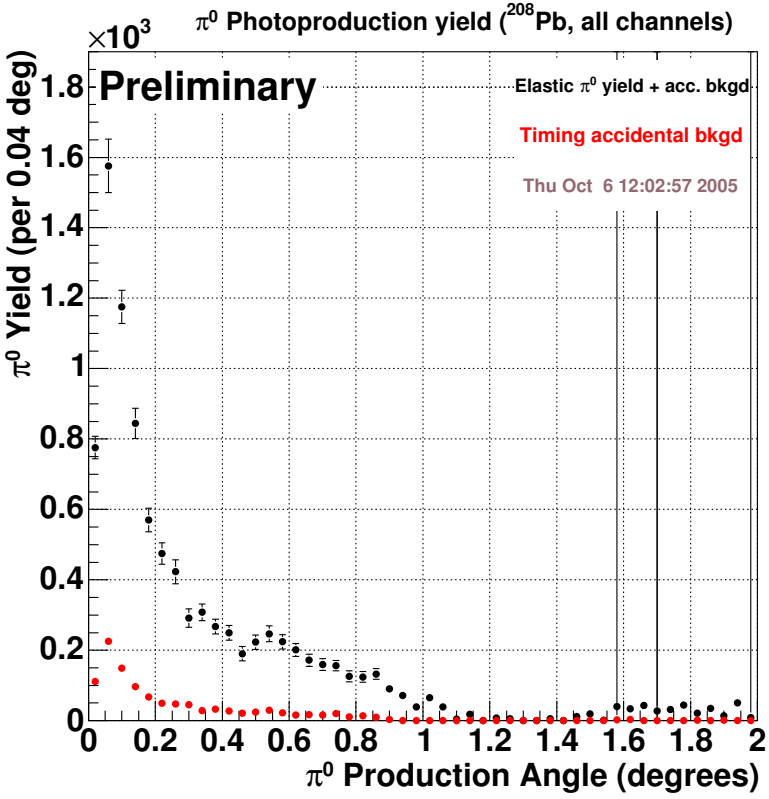


Subtraction of Accidental Timing Bkgd



'In-time' Yields Shown with Out-of-Time Contamination





Final Corrected π^0 Yields