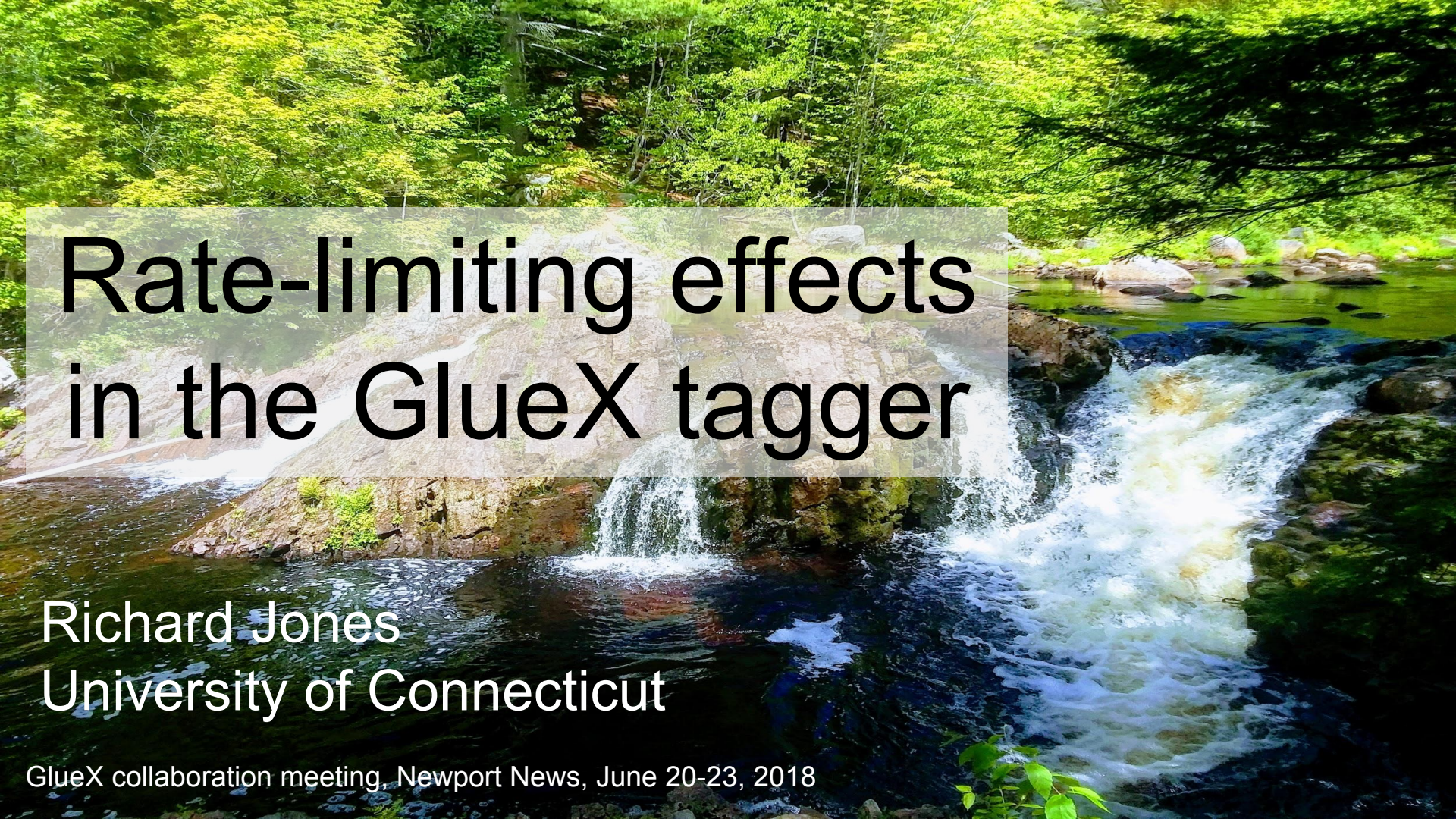


Rate-limiting effects in the GlueX tagger

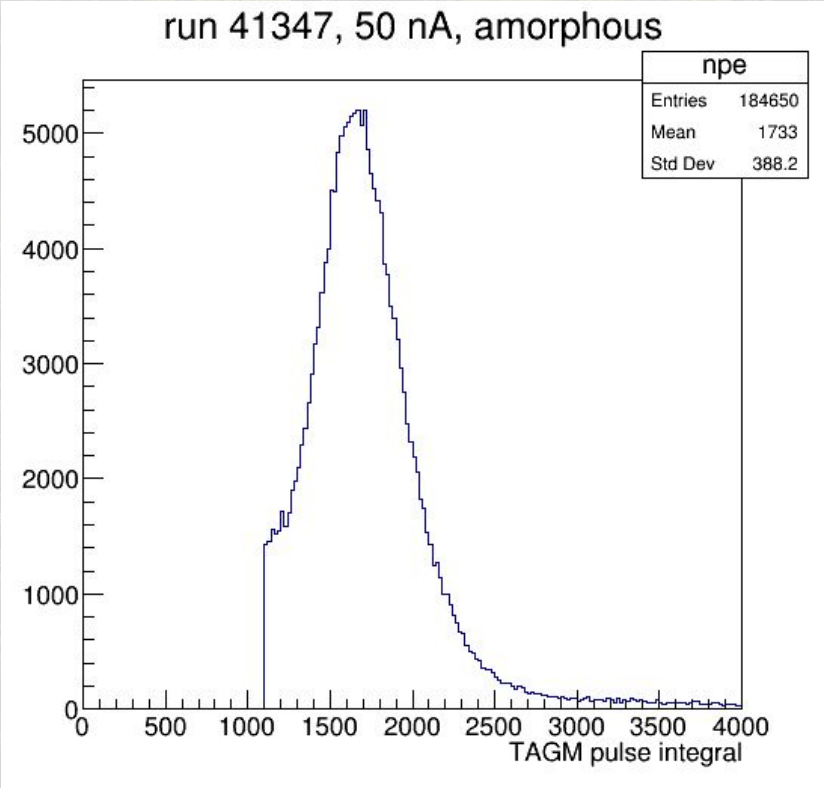
Richard Jones
University of Connecticut

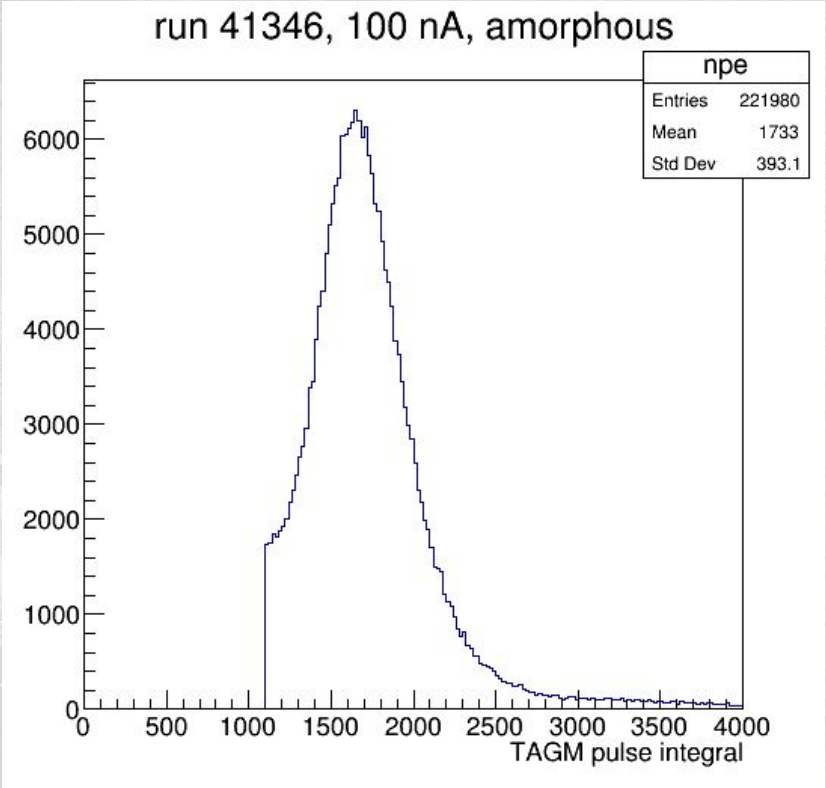
GlueX collaboration meeting, Newport News, June 20-23, 2018

Outline

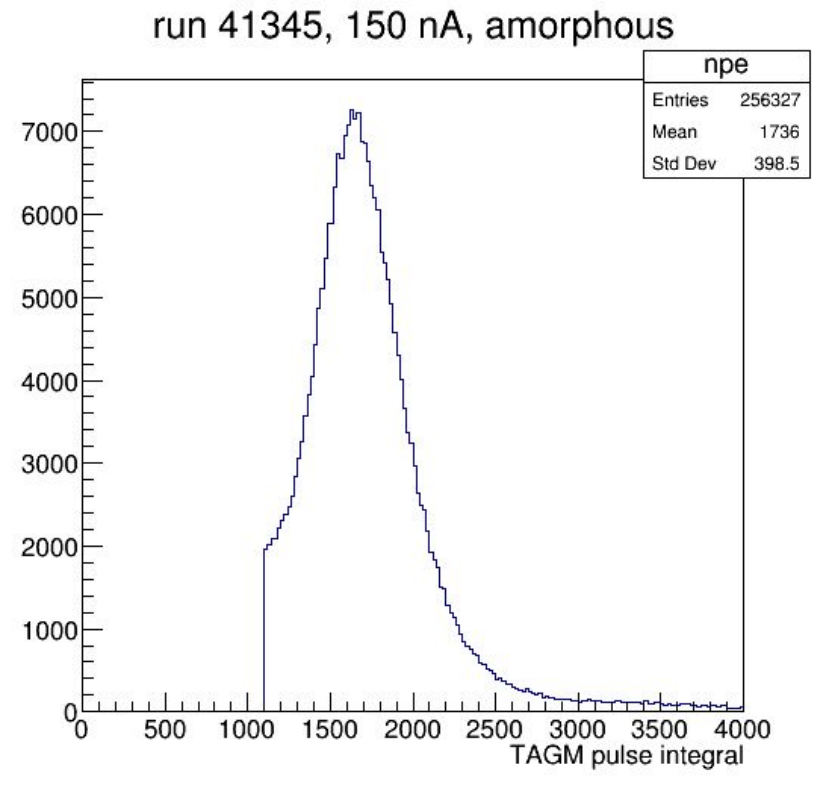
- Beam current scans in 2018 used to study rate dependence in the TAGM
  a. detection efficiency
  b. time resolution
- Comparison with predictions made in 2009
- An unexpected drift, and possible reasons

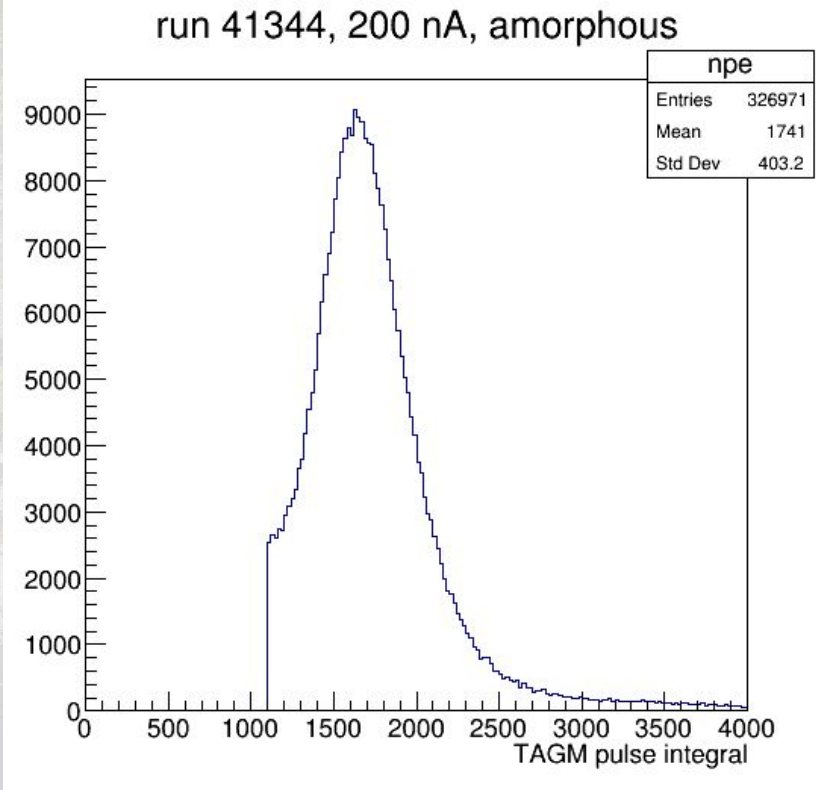
TAGM gain variation with beam intensity



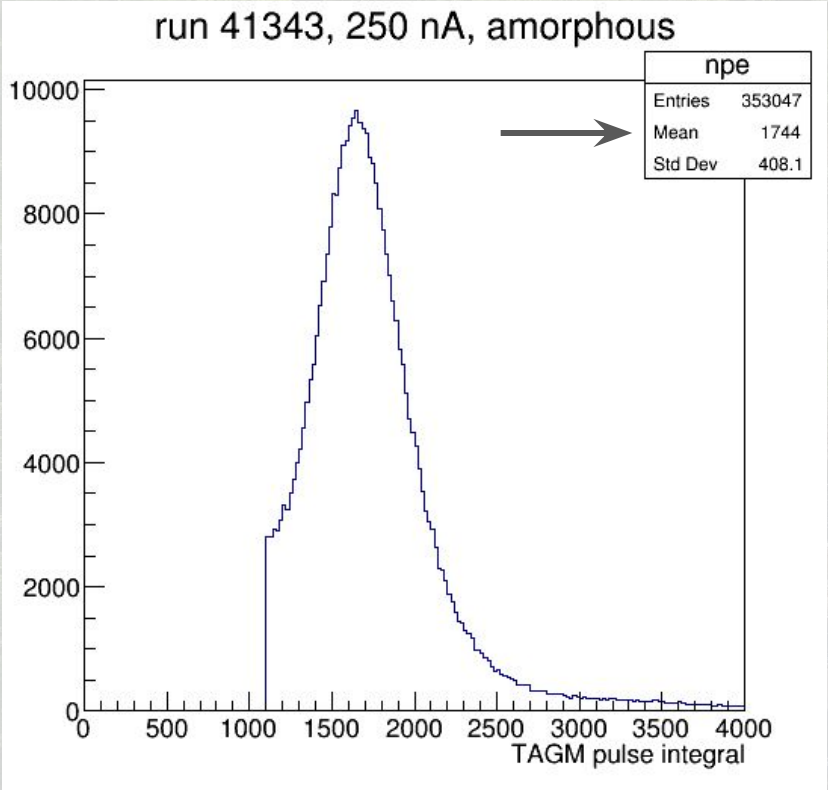


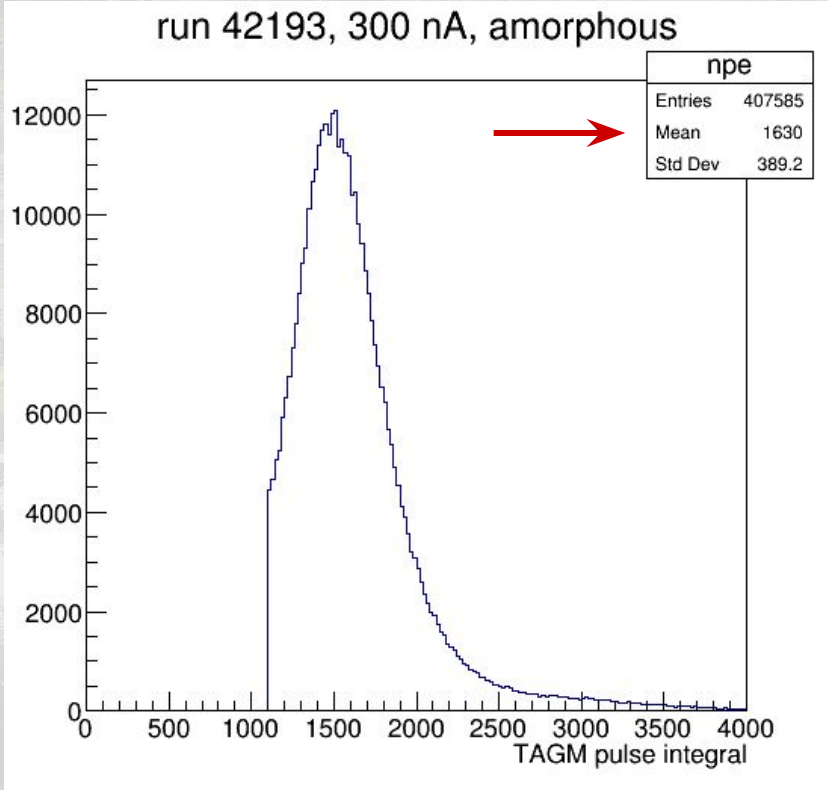
TAGM gain variation with beam intensity



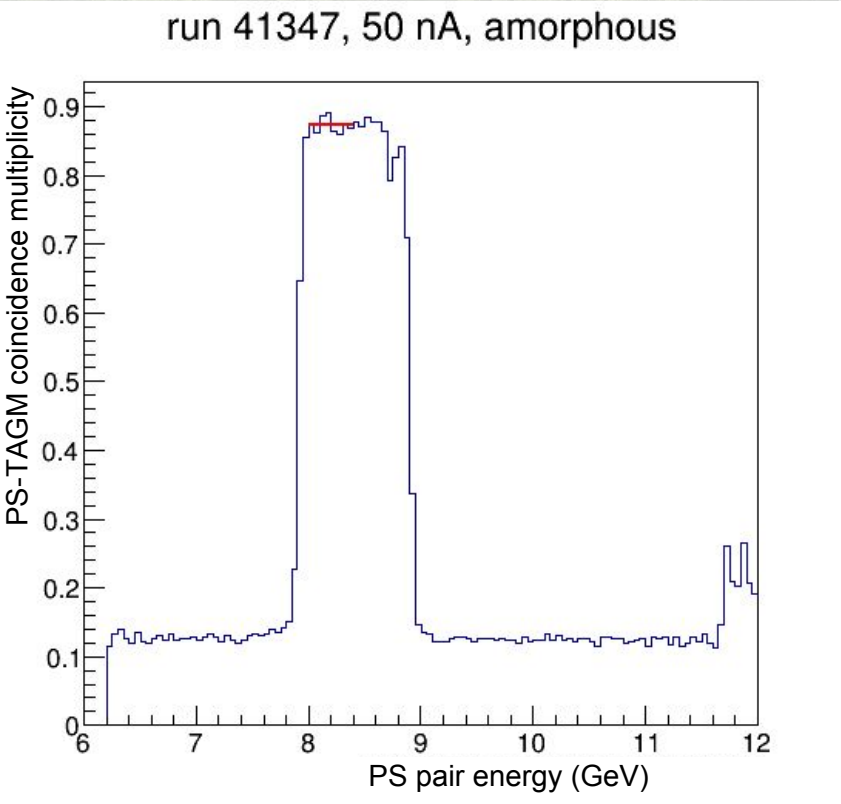


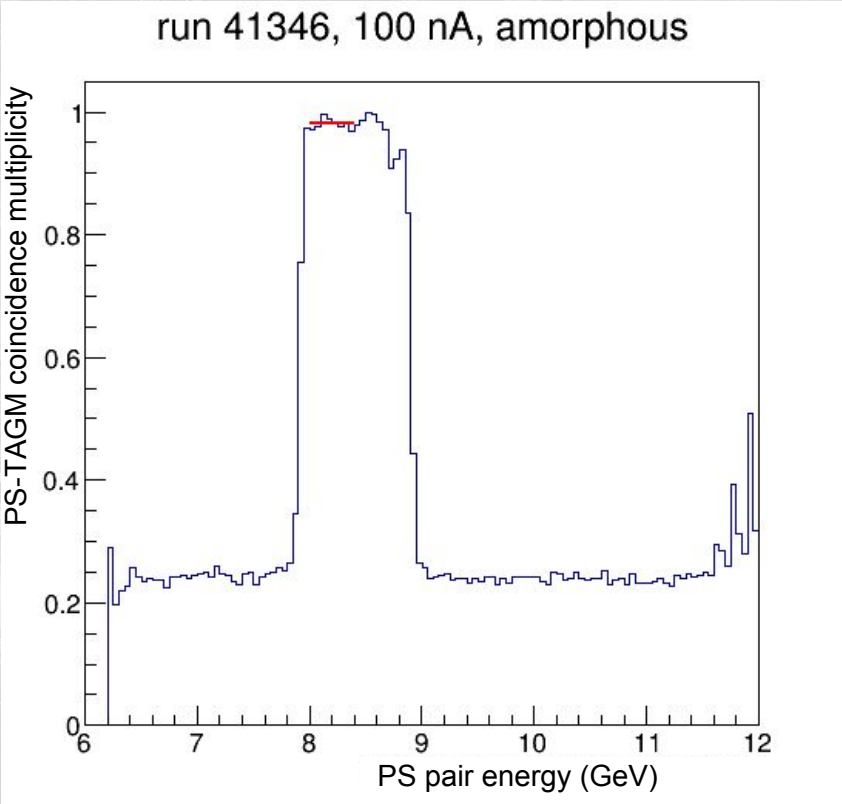
TAGM gain variation with beam intensity



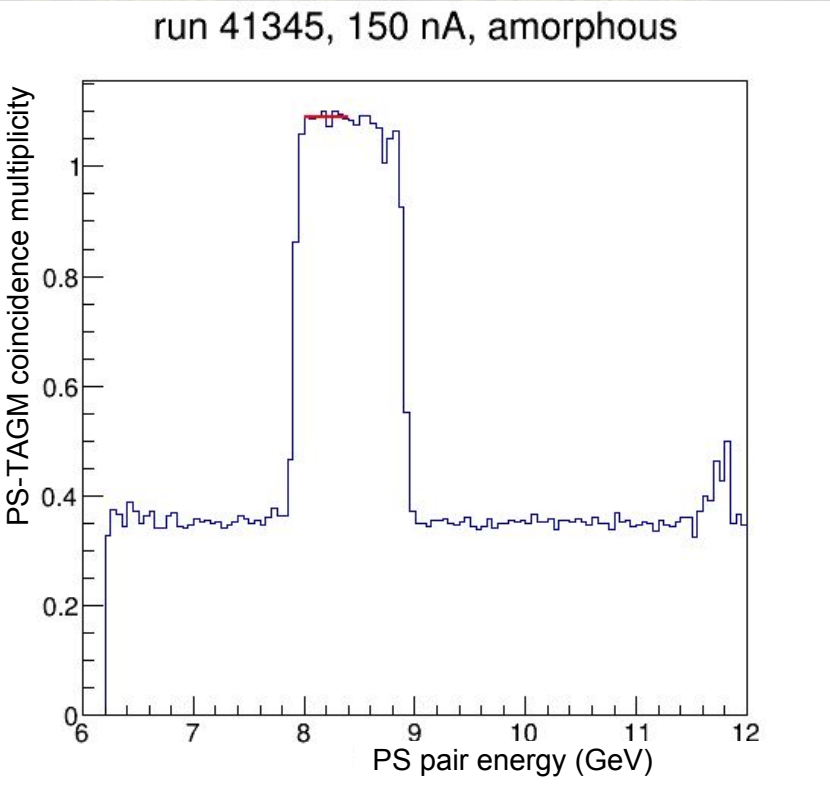


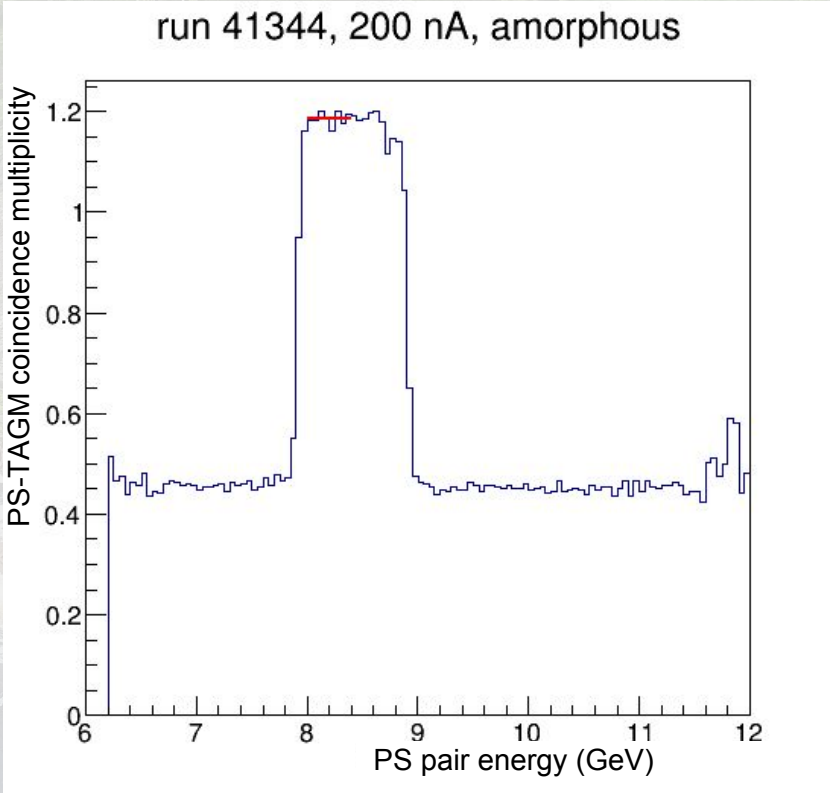
TAGM detection efficiency



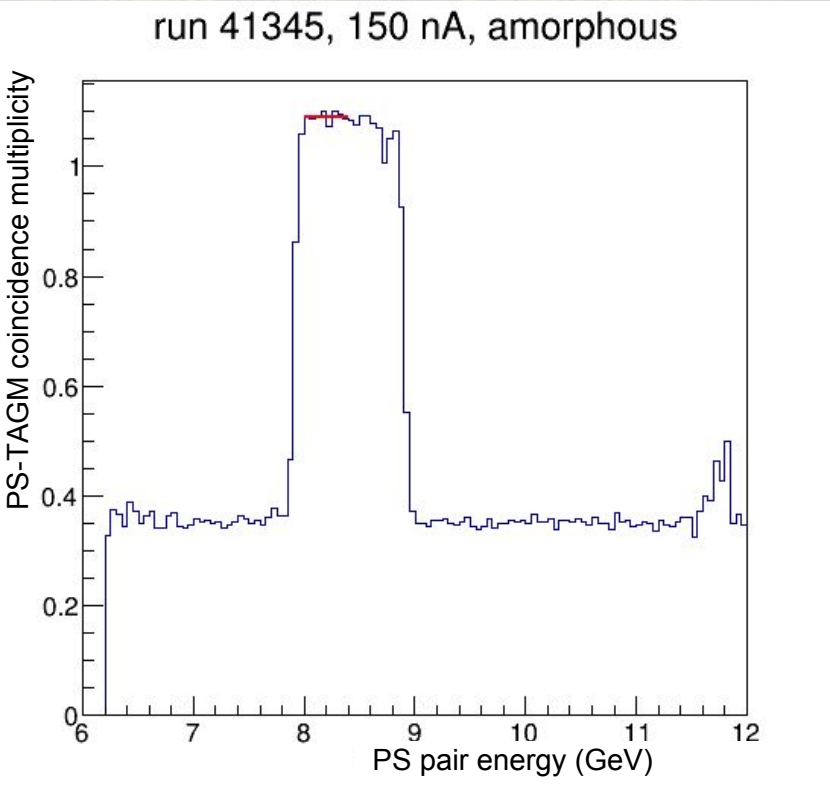


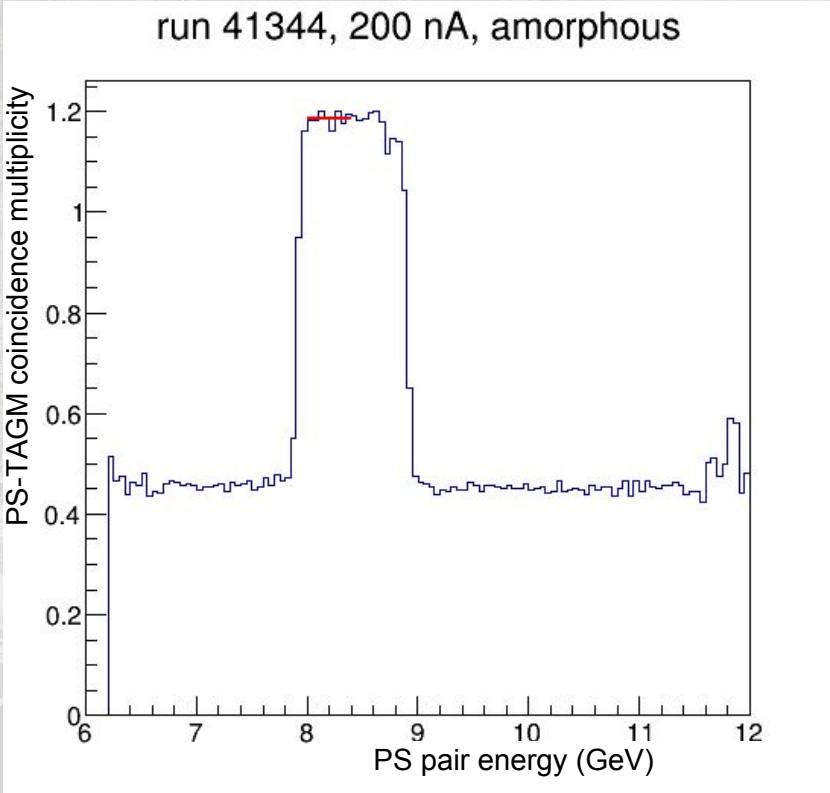
TAGM detection efficiency



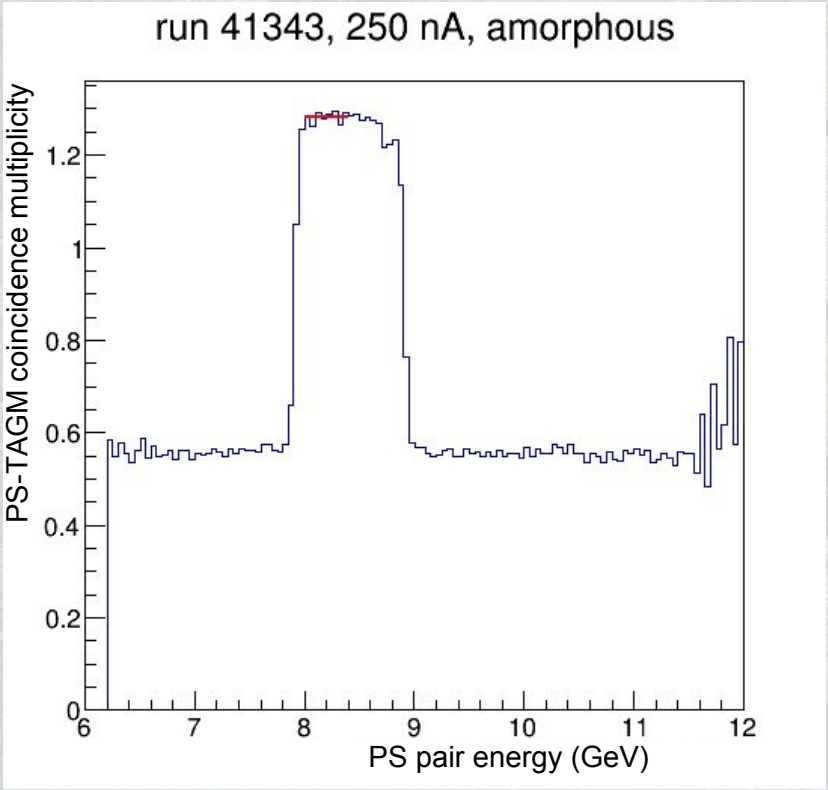


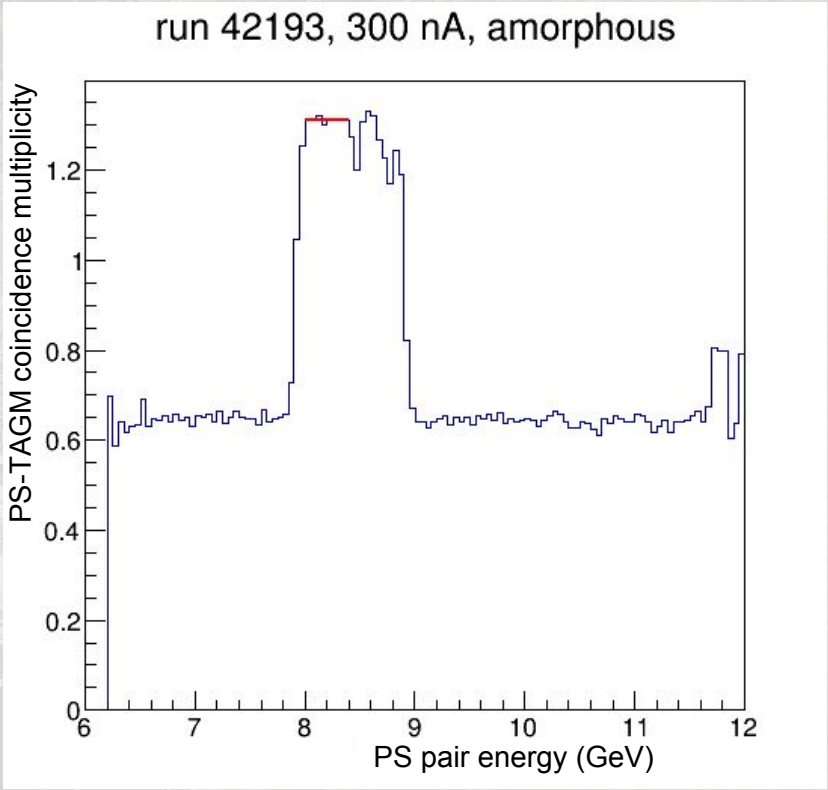
TAGM detection efficiency





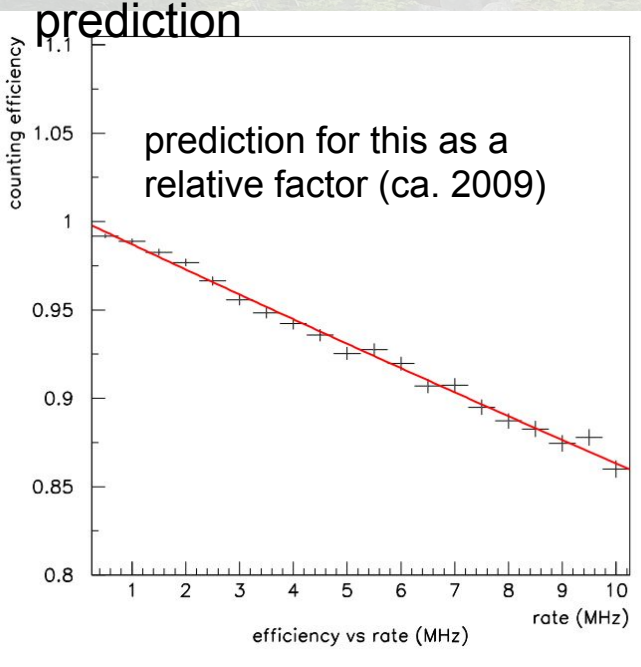
TAGM detection efficiency

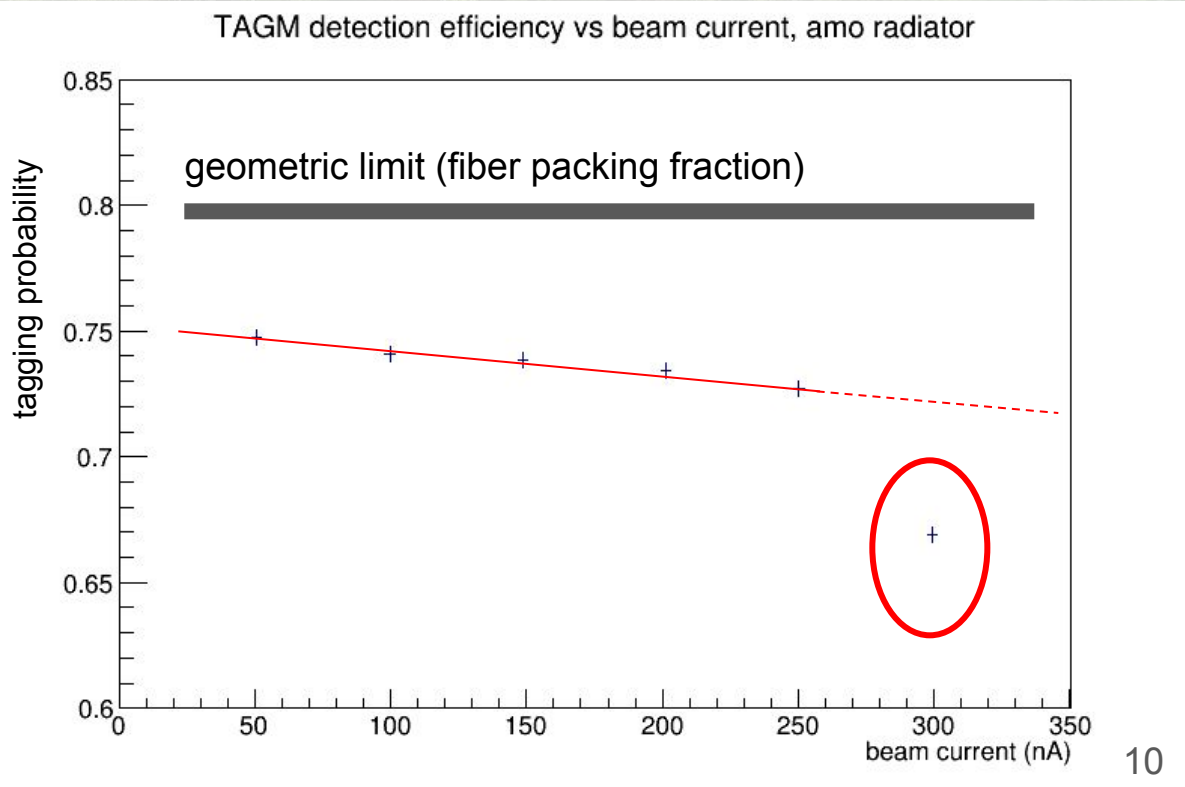




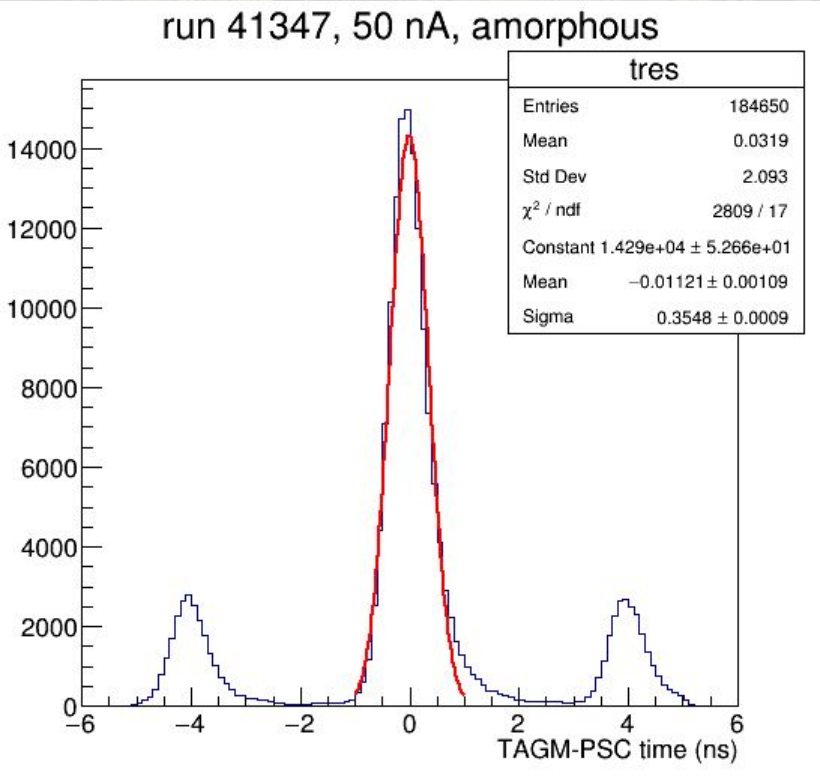
TAGM detection efficiency: summary

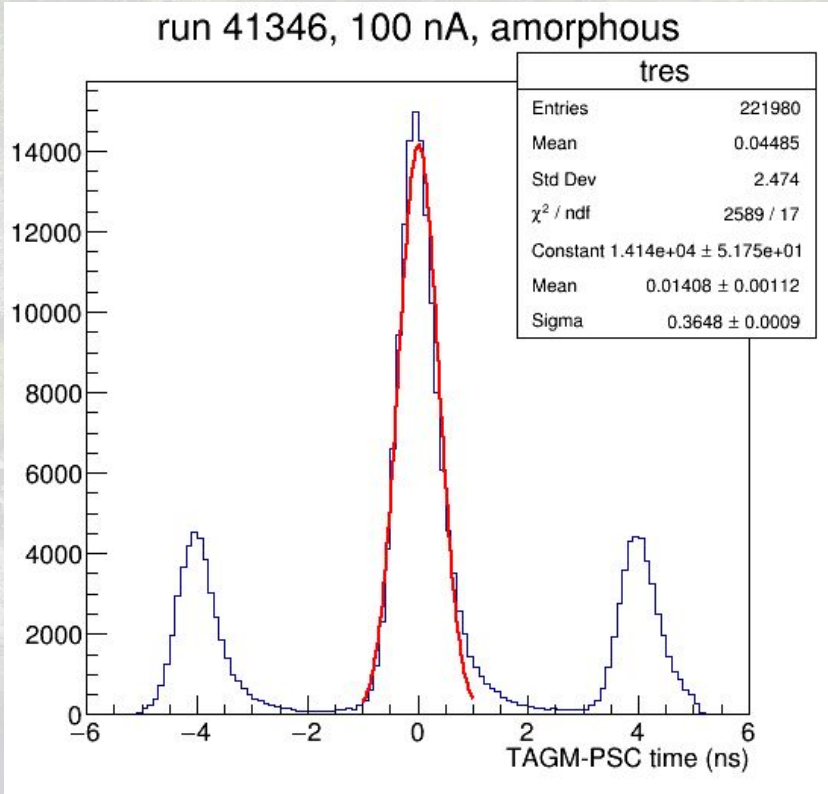
Comparison with prediction



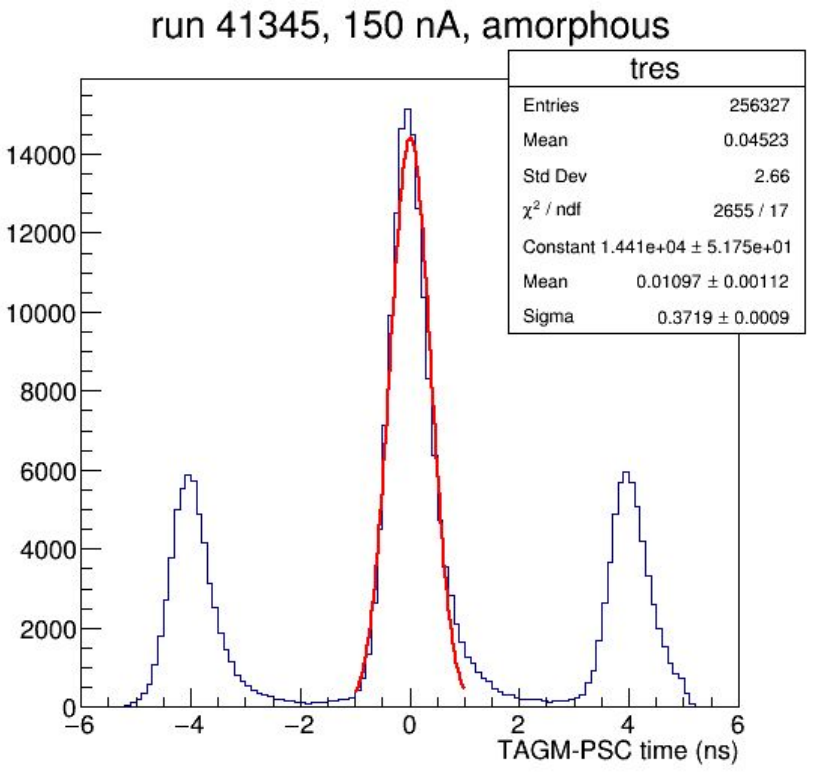


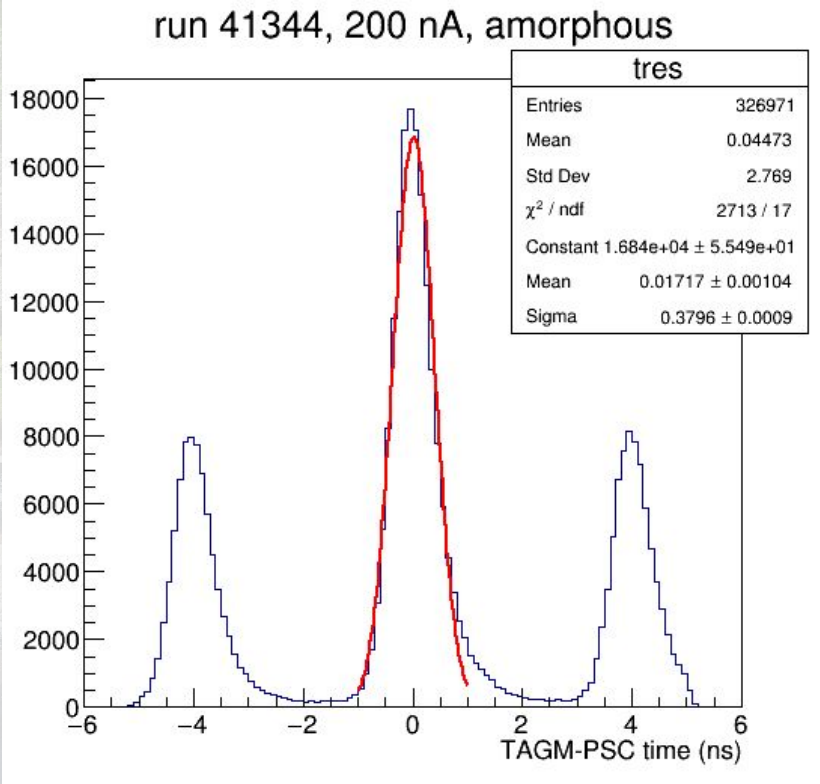
TAGM time resolution



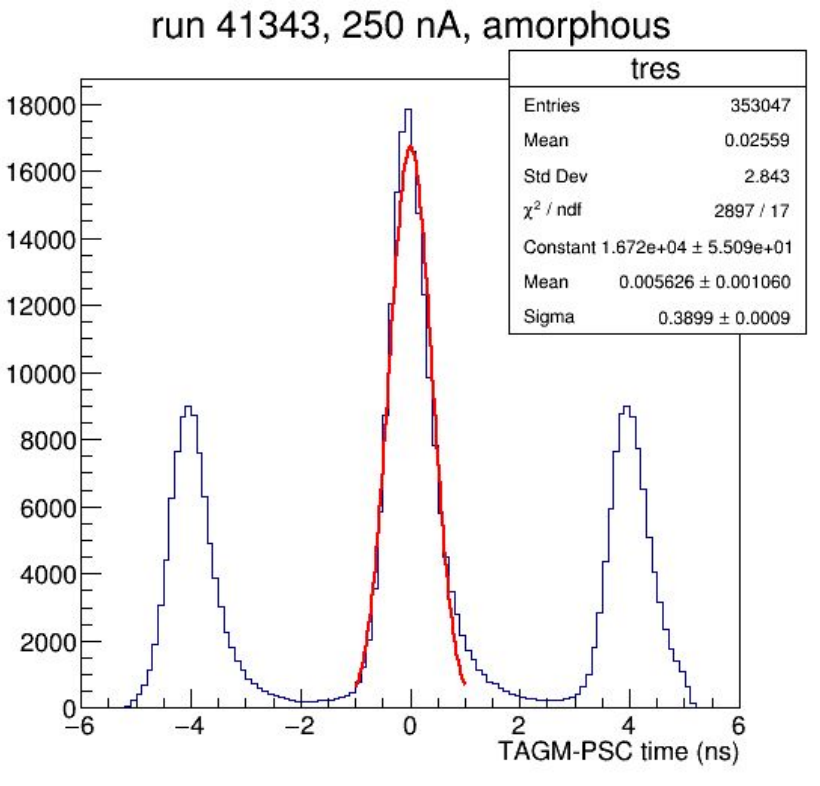


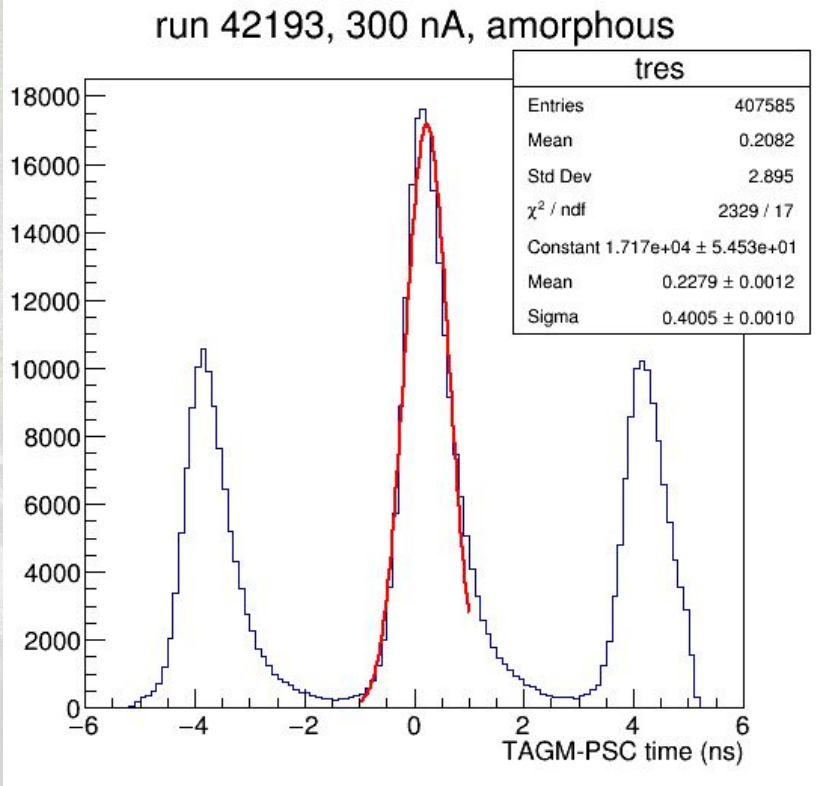
TAGM time resolution





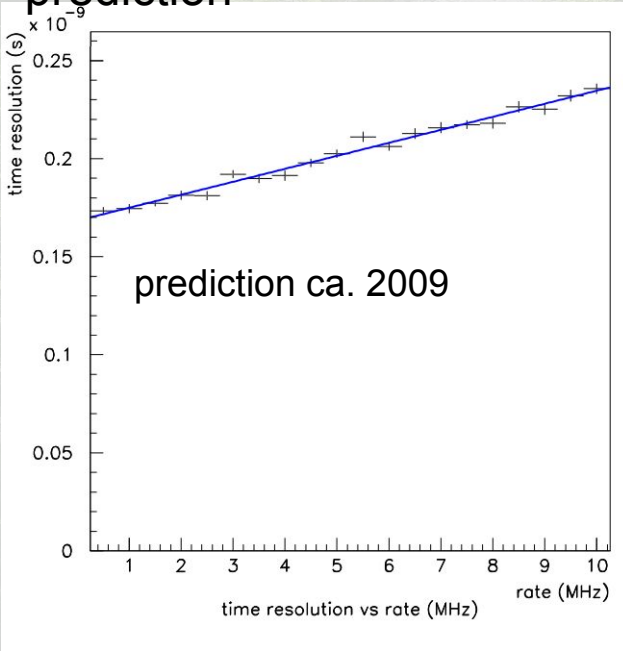
TAGM time resolution

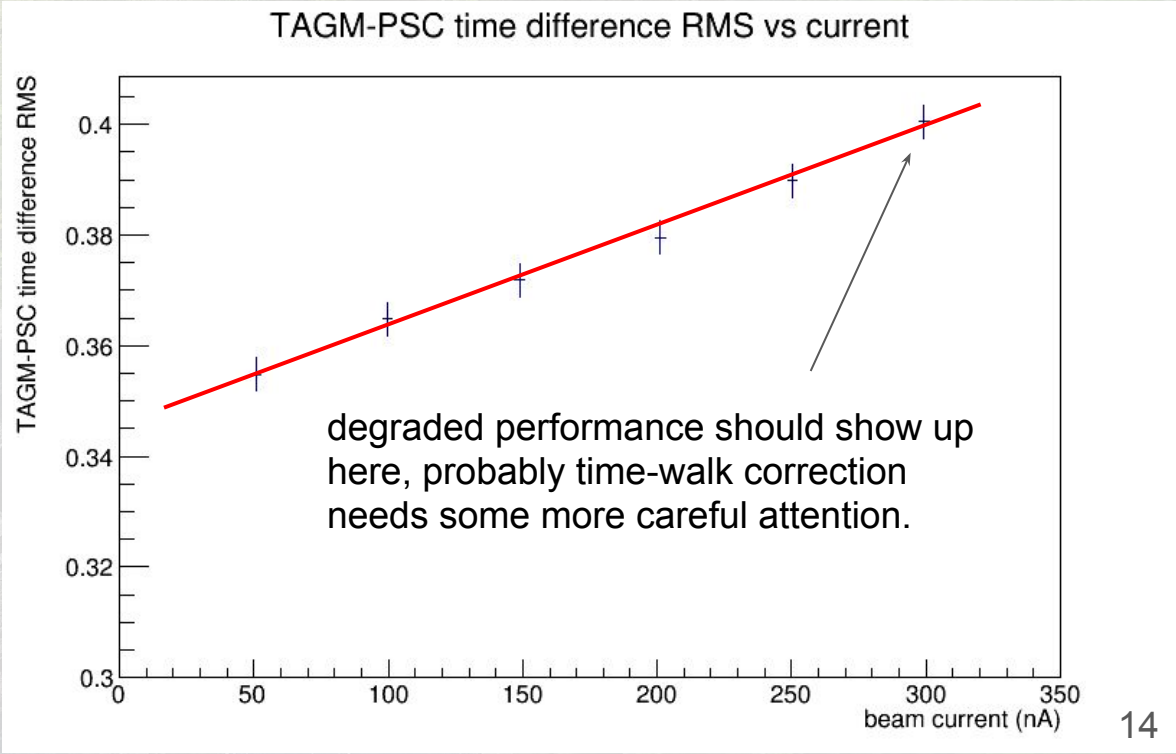




TAGM time resolution: summary

Comparison with prediction





Summary

1. The tagger microscope shows the expected small dependence on beam current, in terms of detection efficiency and time resolution.
2. In 2018 data, current calibrations, the TAGM time relative to the PS shows significant broadening, should be checked against the RF.
3. A significant decrease in output pulse height for the same Vbias was seen between mid-Feb. and mid-April 2018. This could be radiation damage to the fibers, more likely radiation effects in the SiPM. *Should check dark rates*.
4. This can be compensated by increasing the Vbias at the moment, but it should be monitored at regular intervals during future runs.