

TOF

CM 33, Software Session

June 27 2012

- MC Digitizer
- Data, Online

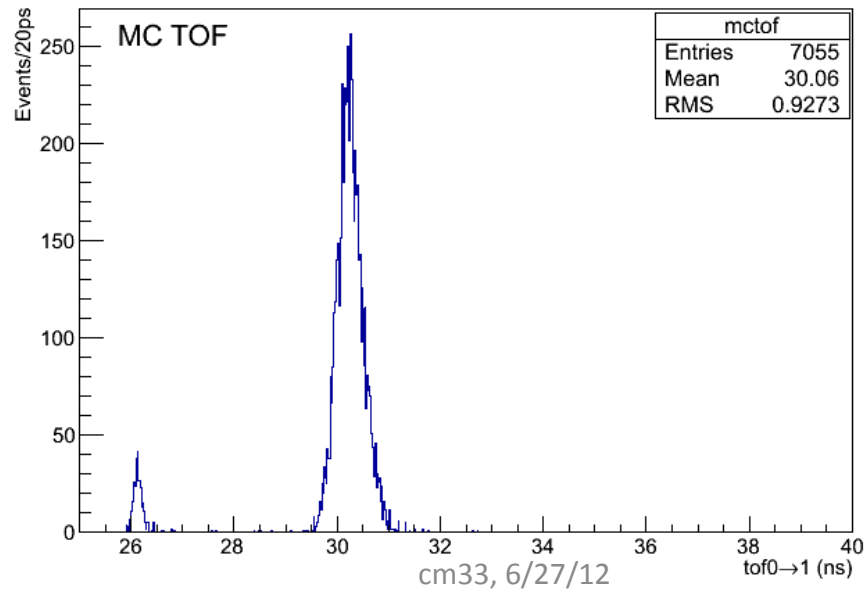
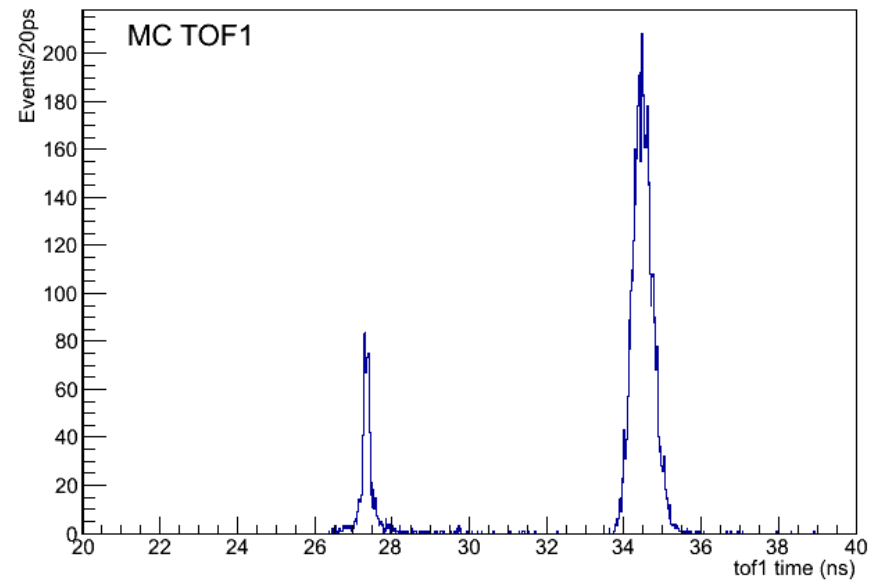
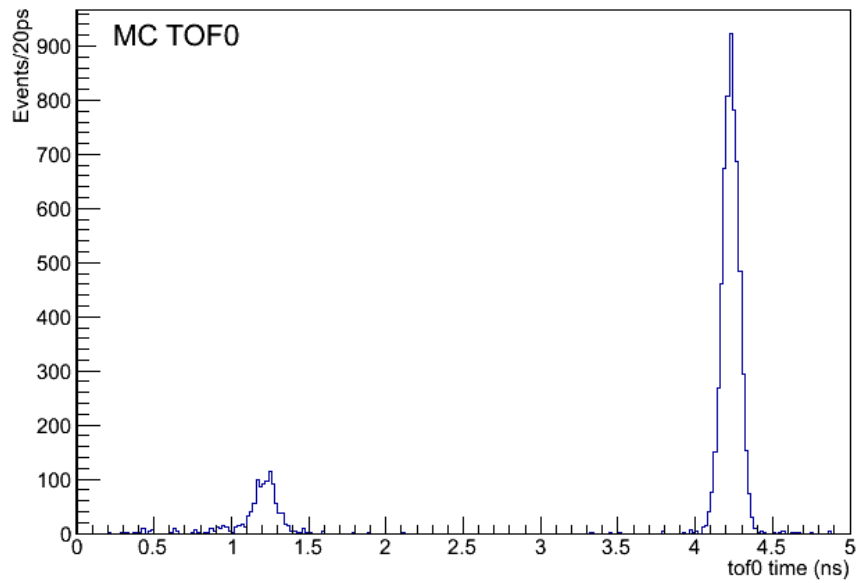
TOF MC Digitization

- Time Digitization:
 - Start with GEANT TOF Hits → Get time & position of hit at slab
→ Propagate time to both PMTs → smear by resolution → “uncalibrate”
→ convert to TDC
 - Time at slab is relative to the time at which the primary particle originated.
 - Cf. for real data, the times are relative to the trigger.
 - For now, no attempt at simulating or faking triggers
 - Uncalibration – calibration constants from ascii file, get correction using TofCalibrationMap, add correction which will then get taken out by reco
- Charge Digitization:
 - Get energy deposit → convert to #p.e. → add up light yields from slab
→ convert to ADC
- Conversion factors, other digitization parameters in ConfigurationDefaults

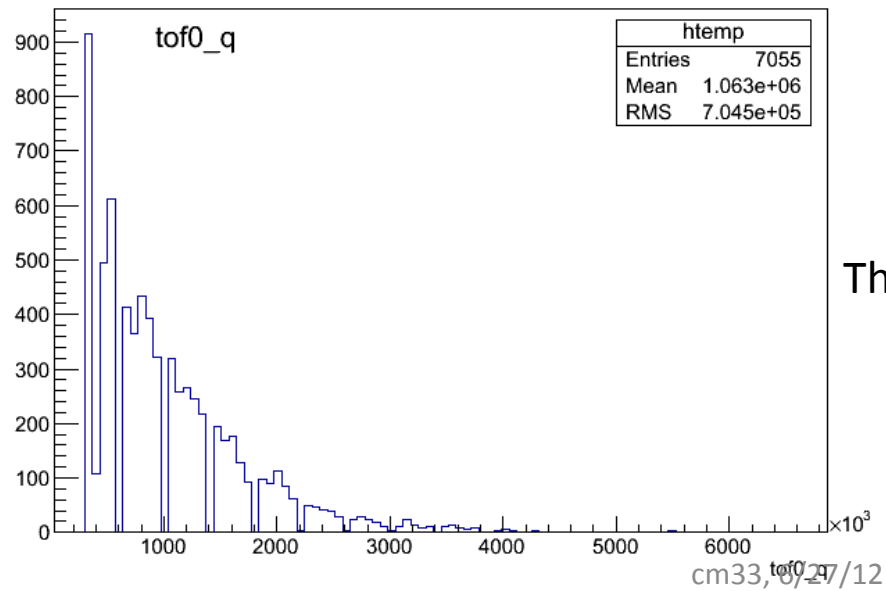
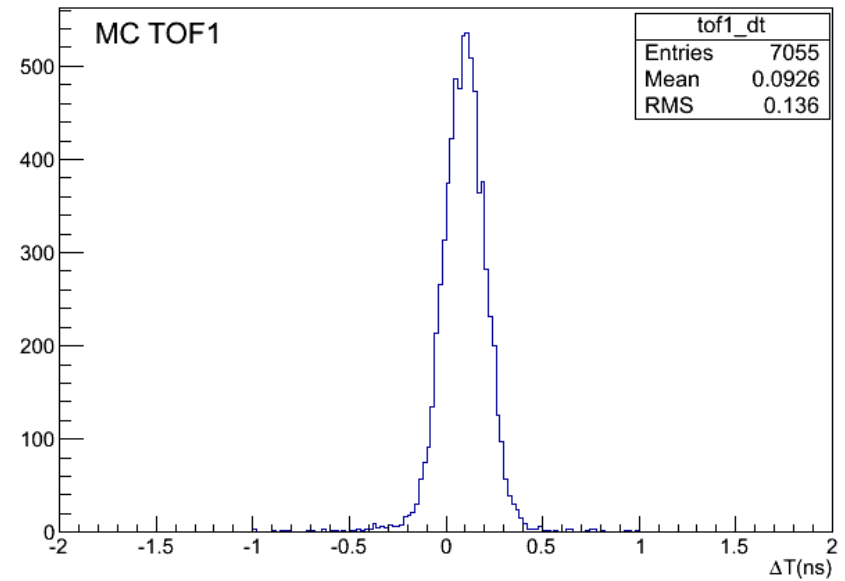
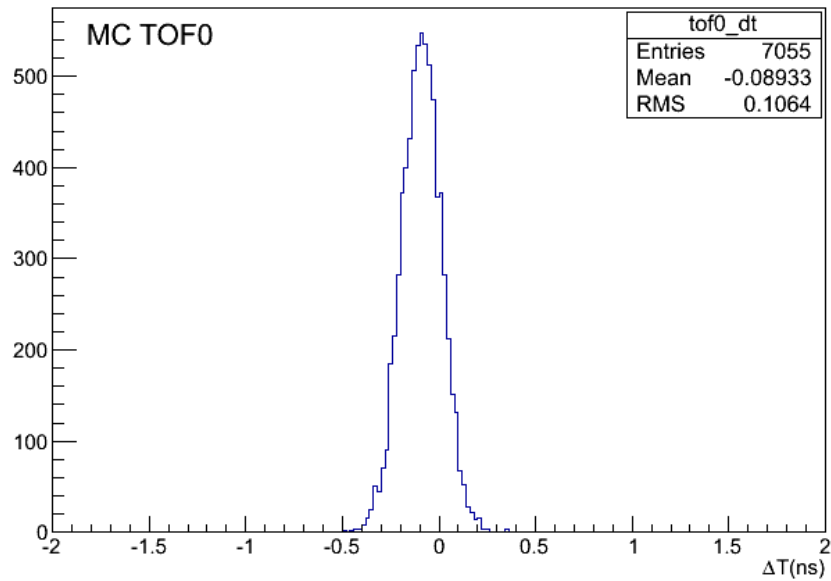
TOF MC Digitization (contd.)

- After the digitizer the reconstruction chain and code is same as for real data, except for one bit of cheating
 - SpacePoint reco tries to find the pixel that triggered the event and has a tolerance window in the search for the trigger pixel. Bloated this up for MC. Should not be necessary after trigger simulation is done.
- TOF code also queries a “daq_event_type”. I have set this in the tof digitizer, but this should go into a global digitizer. Same for “particle_event number”.
- Digitization works to first order

- Time distributions for TOF0, TOF1 & TOF0->1 flight.



- Resolutions are reasonable as a starting point, but the smearing could probably be tweaked



The charge digitization is obviously messed up

To Do (MC)

- Fix charge digitization
- Compare with Truth, compare with data
- Unit tests & documentation

To Do (Data)

- Migrate calibration to DB (Issues #993, 994)
 - ascii files associated with device, calibType, validFromData
 - Same for cabling maps, except no calibType
- Geometry
- Calibration check
- Efficiency histograms in reducer
- TOF rate-effect analysis