

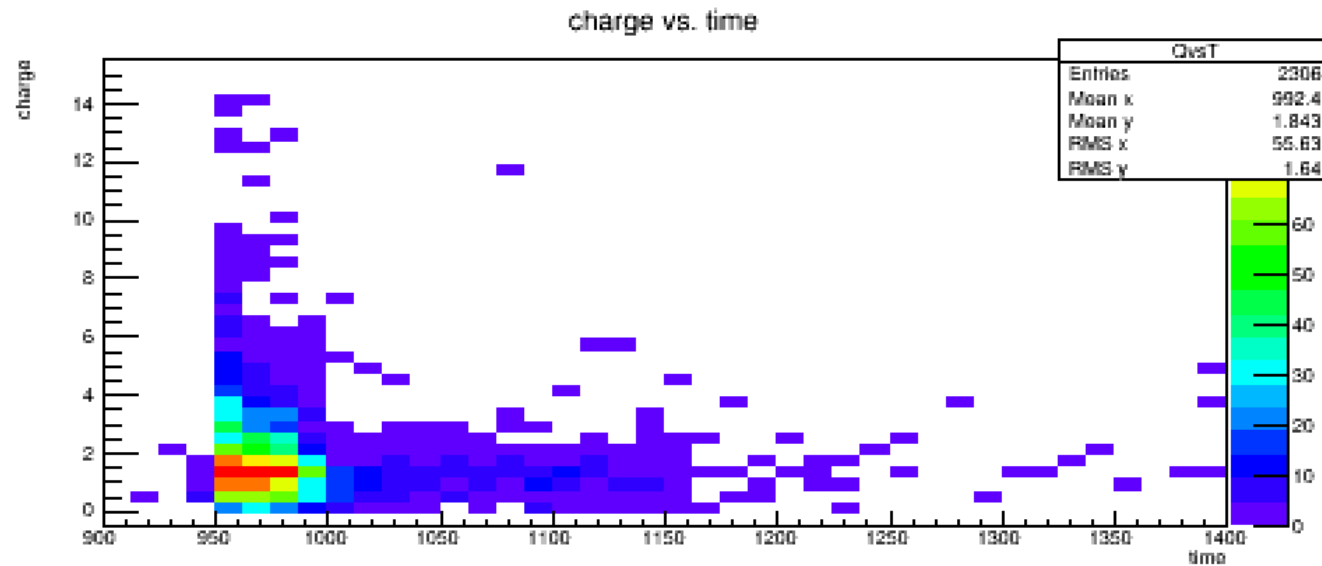
Progress Update

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Run WCSim

- Sample macro: **WCSim.mac**
- Sample read file: **read_PMT.C**



sk_wcsim.mac

- It uses the G4 General Particle Source instead of G4 Particle Gun
- Details:
 - Vertices distributed homogeneously throughout detector
 - within 2m from walls/top/bottom caps
 - Isotropic
 - Energies varying from 200 MeV/c² to 1 GeV/c²

```
/mygen/generator gps  
/gps/ang/type iso  
/gps/particle mu+  
/gps/ene/type Lin  
/gps/ene/min 200 MeV  
/gps/ene/max 1 GeV
```

```
/gps/pos/type Volume  
/gps/pos/shape Cylinder  
/gps/pos/centre 0 0 0  
/gps/pos/radius 14.5 m  
/gps/pos/halfz 18 m
```

sk_wcsim.mac

- But there is **no trigger/PMThits** in the output root file!

```
WCSimWCDigitizerSKI::DigitizeHits START WCHCPMT->entries() = 0
WCSimWCDigitizerSKI::DigitizeHits END DigiStore->entries() 0
WCSimWCTriggerBase::AlgNDigits. Number of entries in input digit collection: 0
Found 0 NDigit triggers
  Filling Root Event
ngates = 0
start[0][0]: 0
start[0][1]: 0
start[0][2]: 0
start[1][0]: 0
start[1][1]: 0
start[1][2]: 0
part 2 start[0]: 1264.16
part 2 start[1]: 696.536
part 2 start[2]: -1743.74
>>>Root event    99
```

WCSim Read Program

- **read_wcsim_images_sub_e.cc** (for electron) and **read_wcsim_images_sub_mu.cc** (for muon)
- These programs were created to read the WCSim output ROOT files and write the PMT charge/timing information to 2D machine learning friendly images.
- Output: an `image_file` containing 2D histograms and an `event_file` containing relevant information

Next Step

- 1. Make `sk_wcsim.mac` run successfully.
- 2. Read the output to see what the txt file looks like.
- 3. Modify the WCSim read program to store images and other information in a root file.