Pseudo-Data
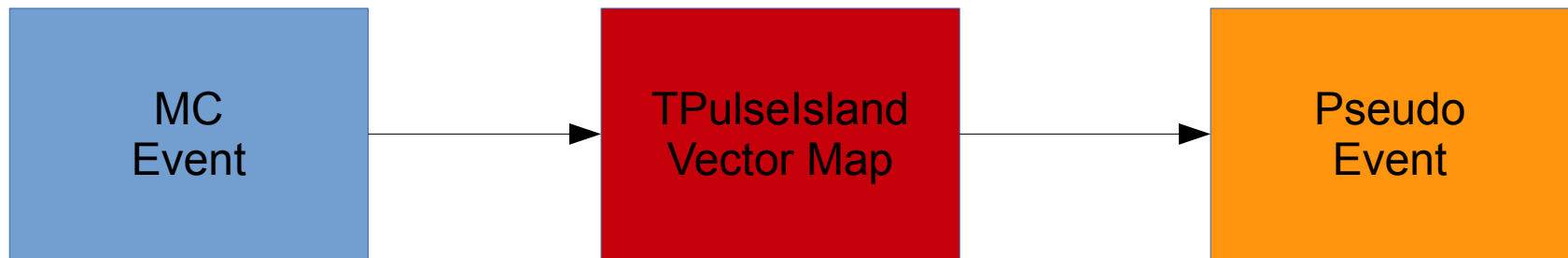
MC Event

= Energy Deposition Hit Information (Energy, Time, Particle ID, Detector ID)
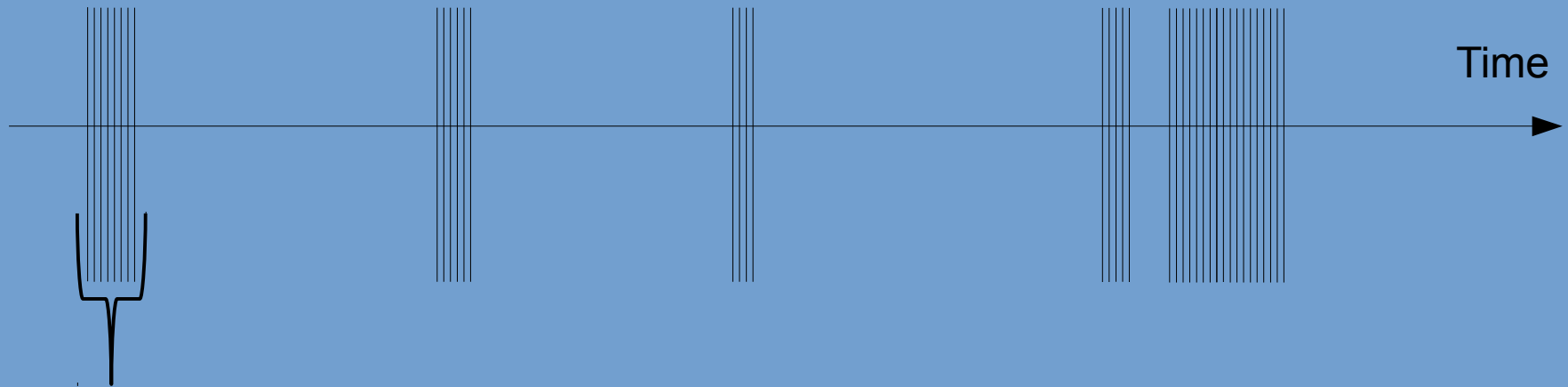
(< 1 ns)

Time

| Muon transport in MuSC | Muon atomic capture in Targ | Muon decay in Targ | Proton passing through SiL1 or SiR1 (Thin Silicon) | Proton stopping in SiL2 or SiR2 (Thick Silicon) |

MC Event to TPulseIslands

T = Time of first energy deposition hit
D = Detector
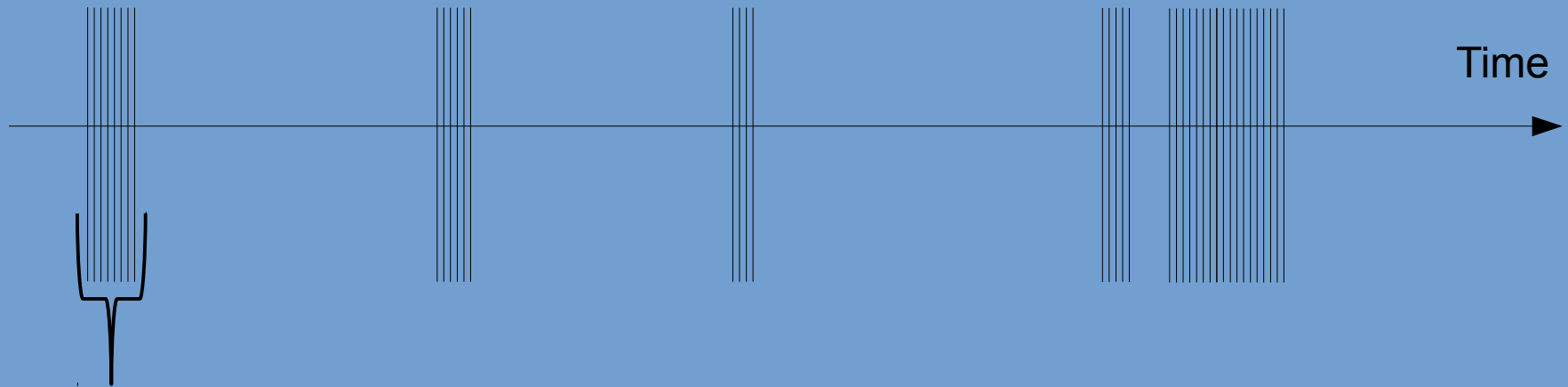E = Total energy in energy deposition hits from first hit to 1 ns later

MC Event to TPulseIslands
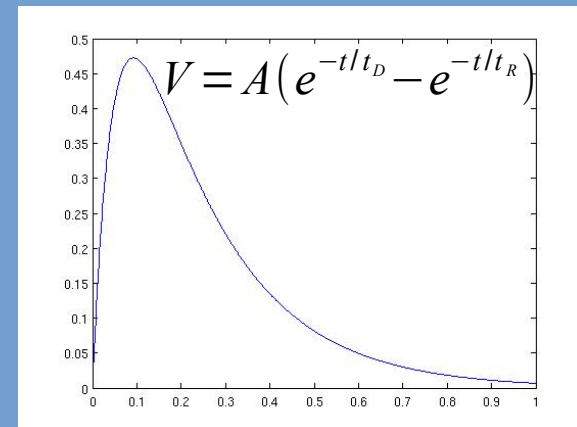
Time

T = Time of first energy deposition hit
D = Detector
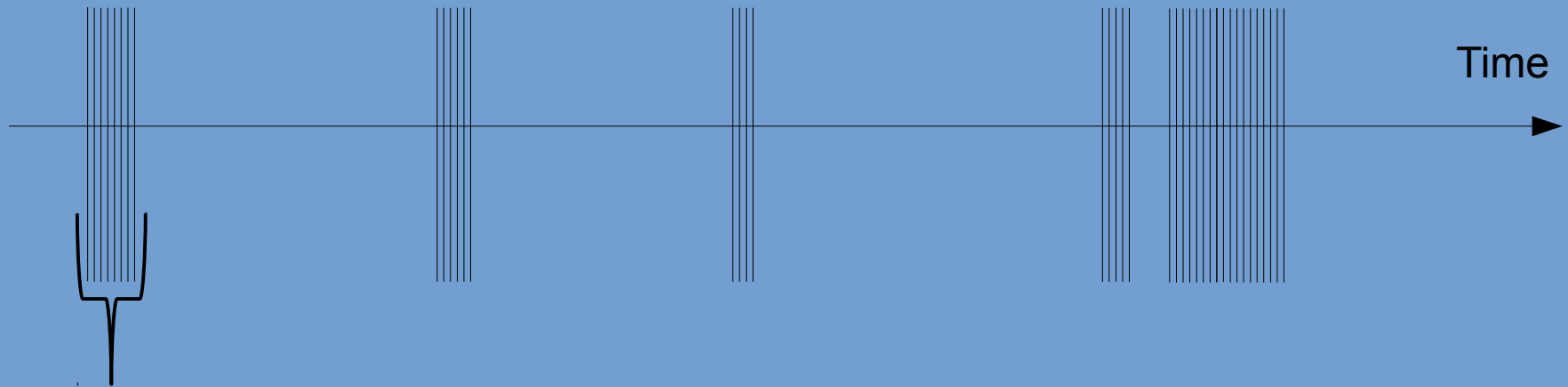E = Total energy in energy deposition hits from first hit to 1 ns later

A = Amplitude
t_D = Decay time
t_R = Rise time

$A \propto E$

$$V = A\left(e^{-t/t_D} - e^{-t/t_R}\right)$$

MC Event to TPulseIslands

Time

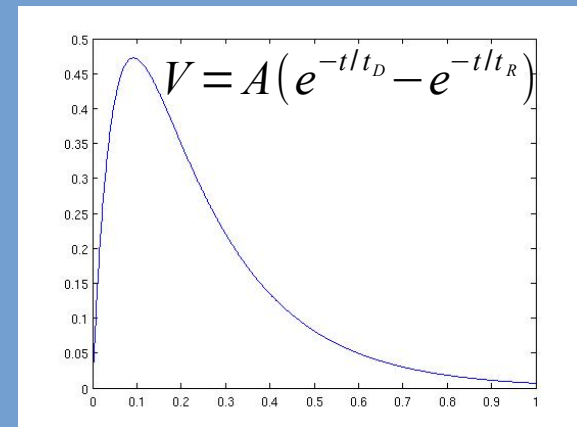T = Time of first energy deposition hit since muon was generated
D = Detector
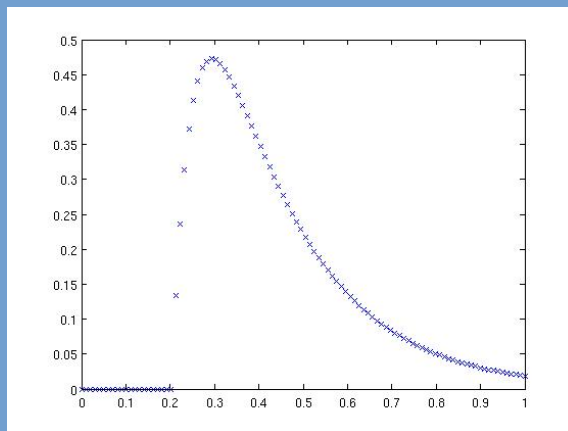E = Total energy in energy deposition hits from first hit to 1 ns later

A = Amplitude
t_D = Decay time
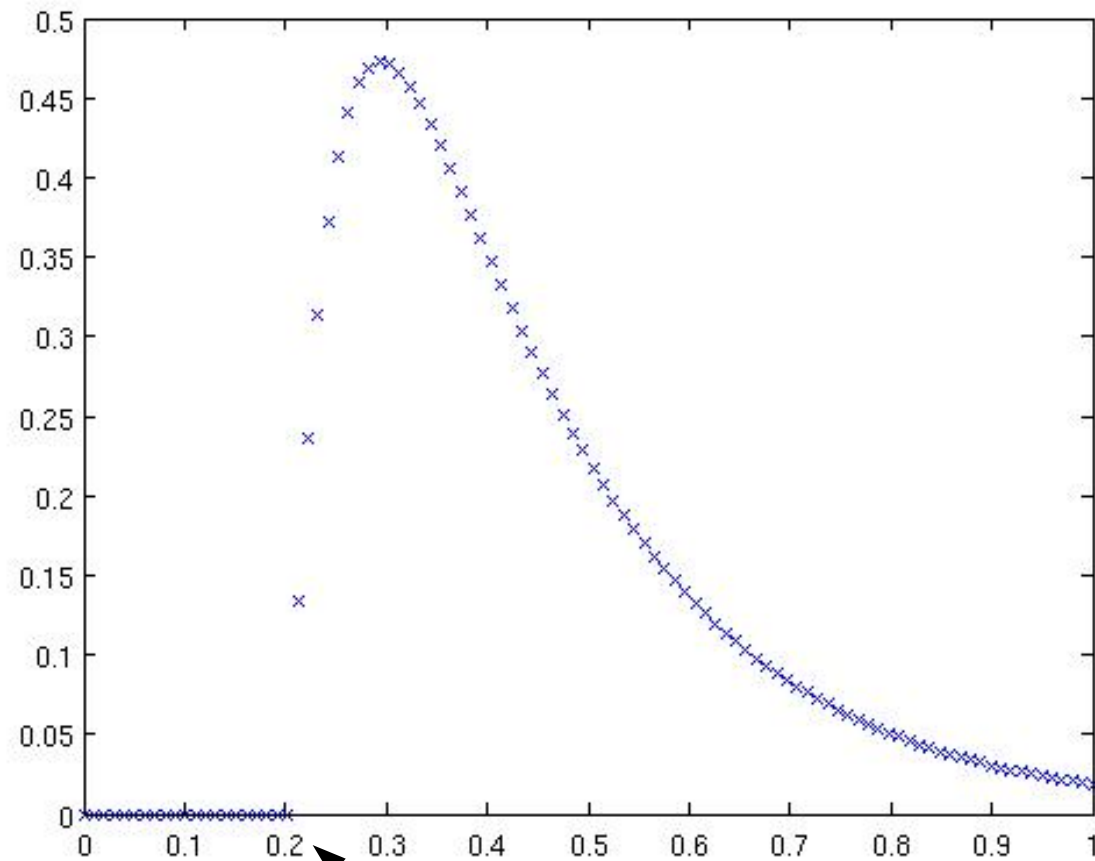t_R = Rise time

$A \propto E$

$$V = A \left(e^{-t/t_D} - e^{-t/t_R} \right)$$

MC Event to TPulseIslands

MC Event to TPulseIslands

TPulseIsland:
- ➔ Vector of samples
- ➔ Time of first tick
- ➔ Tick Length (1 / Dig. Freq.)
- ➔ Bank name

MC Event to TPulseIslands

TPulseIsland:
➔ Vector of samples
➔ Time of first tick
➔ Tick Length (1 / Dig. Freq.)
➔ Bank name

<u>Time of First Tick</u>

· For each new MC event, add a random time chosen from

$$f_{beam} e^{-t f_{beam}}$$

to all energy deposition hit times in that MC event

· Collect all TPulseIslands into vectors corresponding to detectors, which are not necessarily time ordered (different from Peter W.'s step)

· Stop when cumulative time is greater than 10 ms, package it up, then restart

TPulseIsland Vector Map
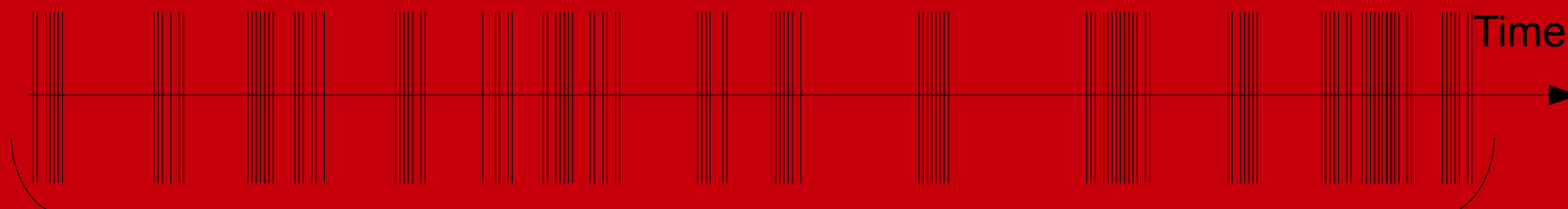
Time

10 ms window is entry in tree of TGlobalData

TGlobalData = Map of bank names (detectors)
to vectors of TPulseIslands

Bank List
· MuSC
· Targ
· Targ_TFA
· Veto
· SiR1
· SiR1_TFA
· SiR2
· SiR2_TFA
· ScR
· SiL1
· SiL1_TFA
· SiL2
· SiL2_TFA
· ScL

Input Parameters
· Rise times
· Decay times
· Polarity
· Threshold
· Pedestal
· Energy to ADC
  · Maximum energy
  · Bits

TPulseIsland Vector Map to Event

Just will follow current setup as laid out in Peter W's elog (86)
post of his, Michael's, and Volodya's slides