Trigger On/Offline for NEMO phase 2
+
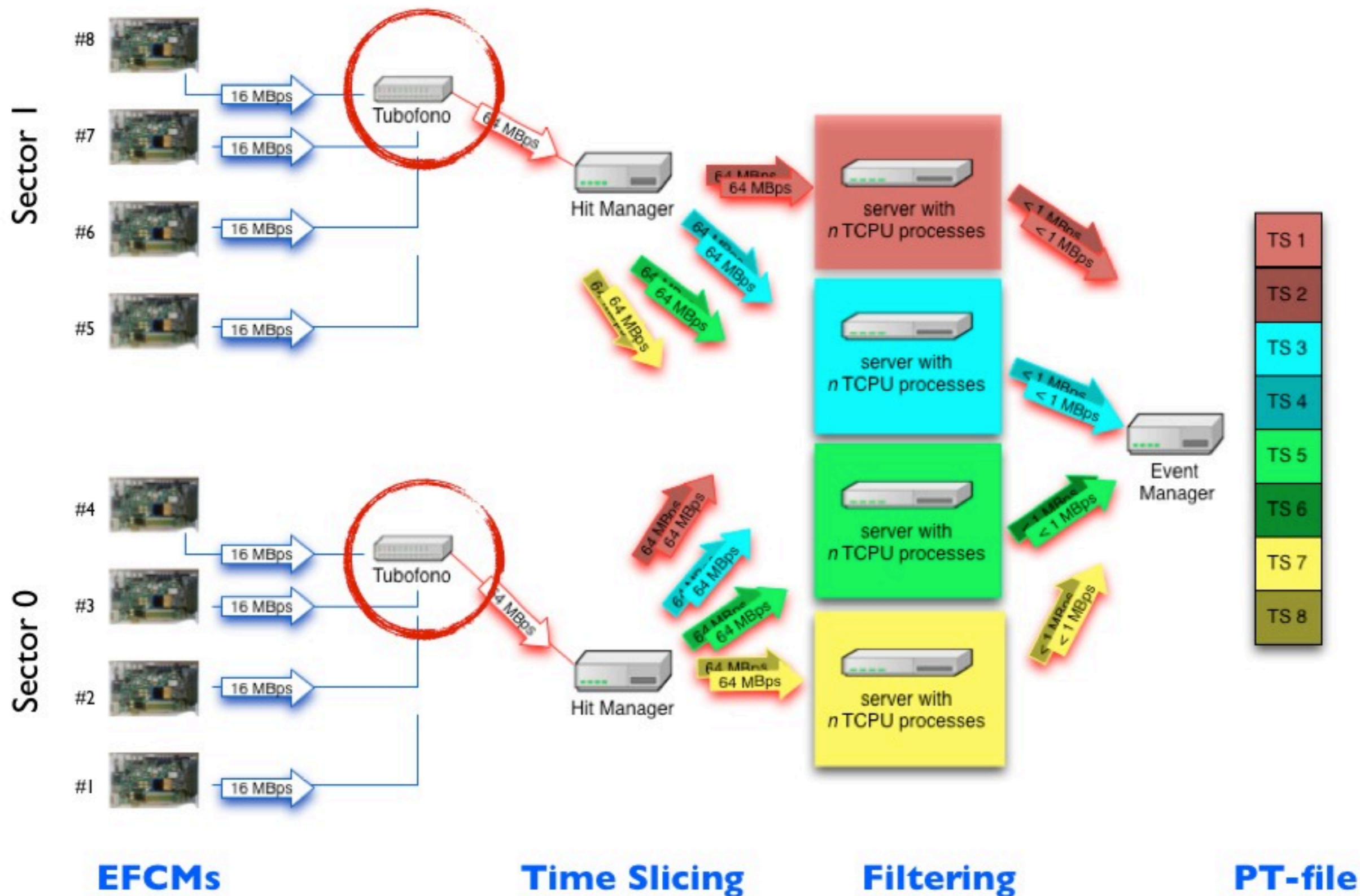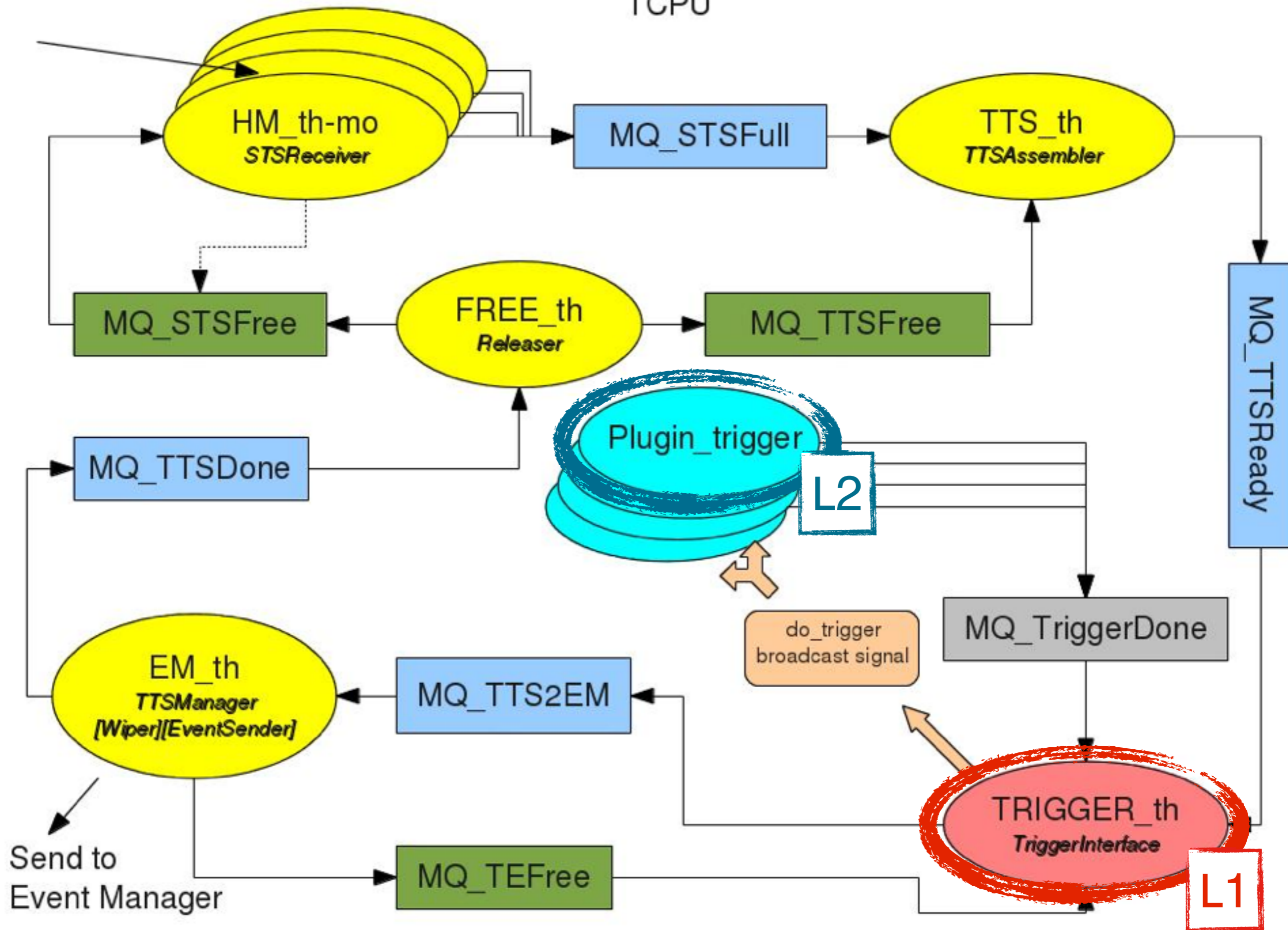# Starting studies in Bologna

T. Chiarusi

INFN - Sezione Bologna

Please note: each TCPU process DON'T get directly subsequent Timeslices

Receive from Hit Manager

with G. Terreni

TCPU
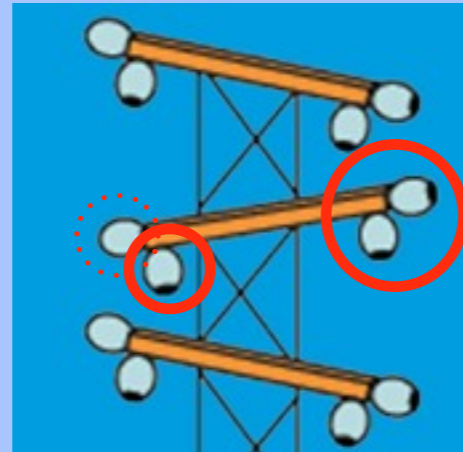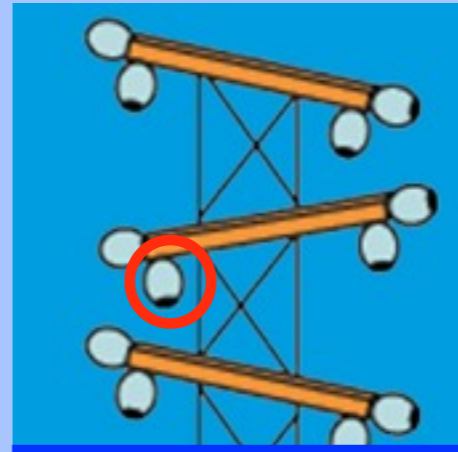
HM_th-mo
STSReceiver

MQ_STSFull

TTS_th
TTSAssembler

MQ_STSFree

FREE_th
Releaser

MQ_TTSFree

MQ_TTSReady

Plugin_trigger

L2

MQ_TTSDone

do_trigger
broadcast signal

MQ_TriggerDone

EM_th
TTSManager
[Wiper][EventSender]

MQ_TTS2EM

TRIGGER_th
TriggerInterface

L1

Send to
Event Manager

MQ_TEFree

Friday, June 21, 2013

L1 triggers
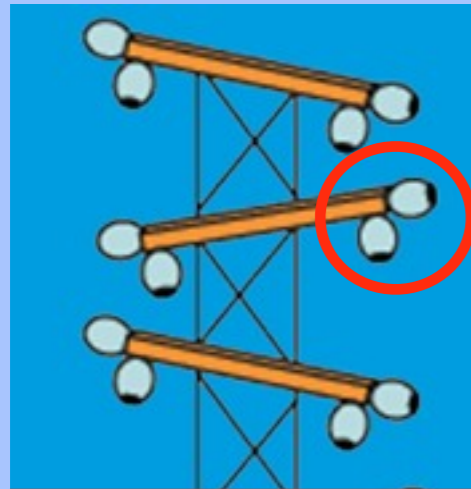
SC (20 ns)	FC (SC in 20 ns + PMT in 100 ns)	$Q_{threshold}$ ($Q_{first10\ samples} > 1000$)	Random (1 ms @ 1 Hz)
1:100	1:10	no	1:1

Draft L2 plugins
since 4 Jun 2013
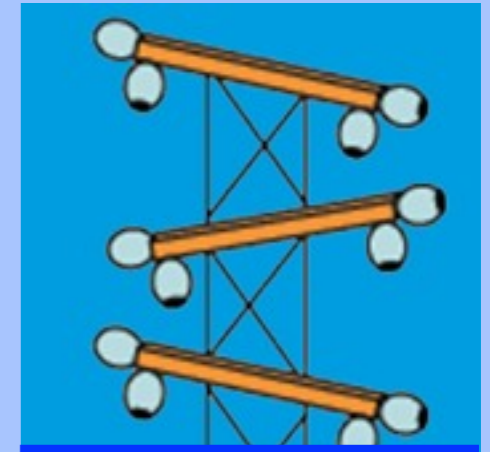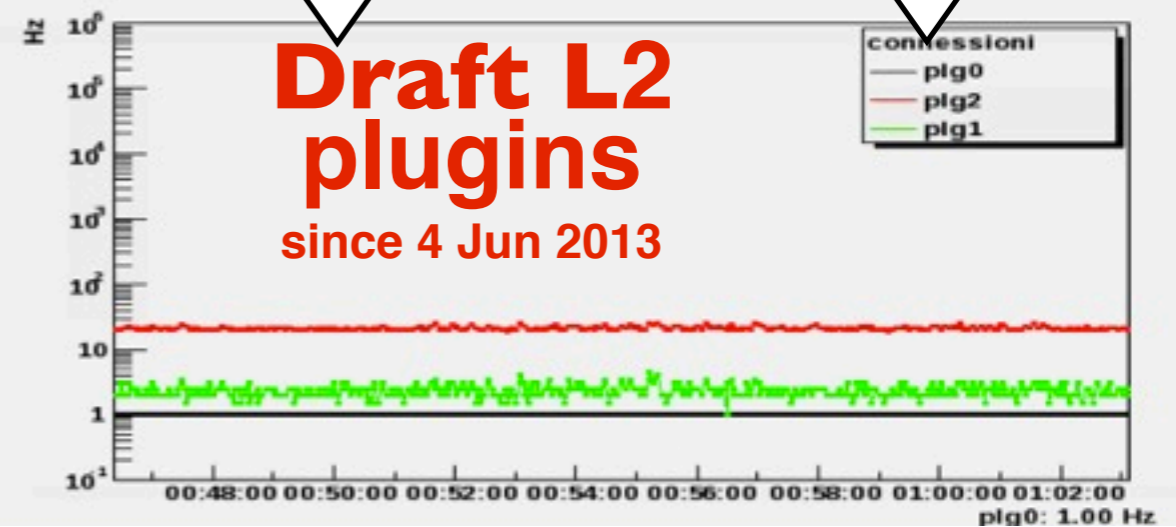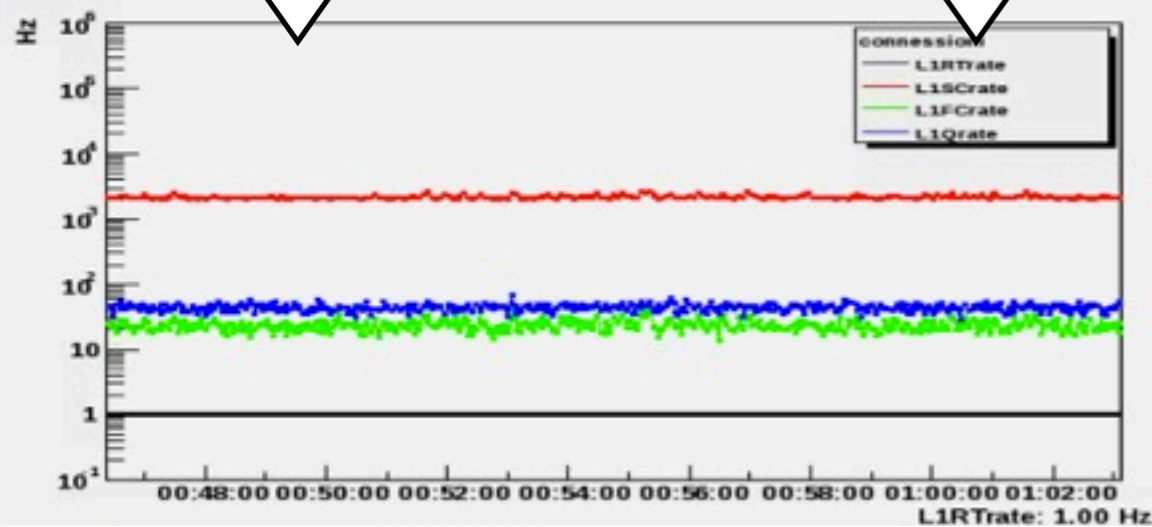
My proposal waiting for qualified L2 algos
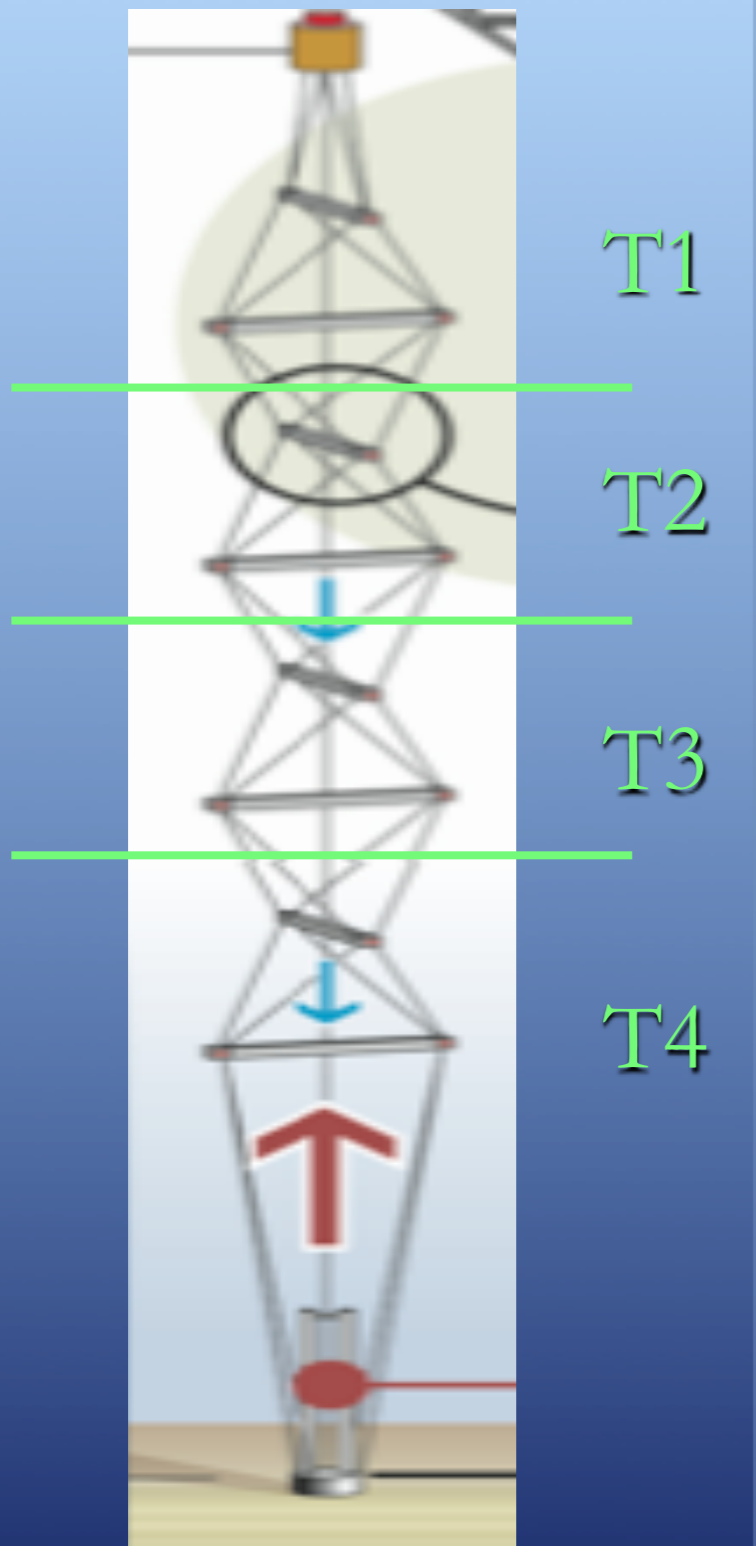
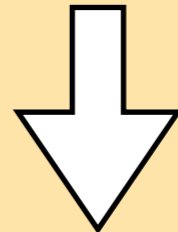| 1:100	1:1	??	1:1
but all if #SC >2			

4

Further Proposal - **but a MC study is mandatory!**

T_i = average time of the sub-sector

T1 < T2 < T3 < T4

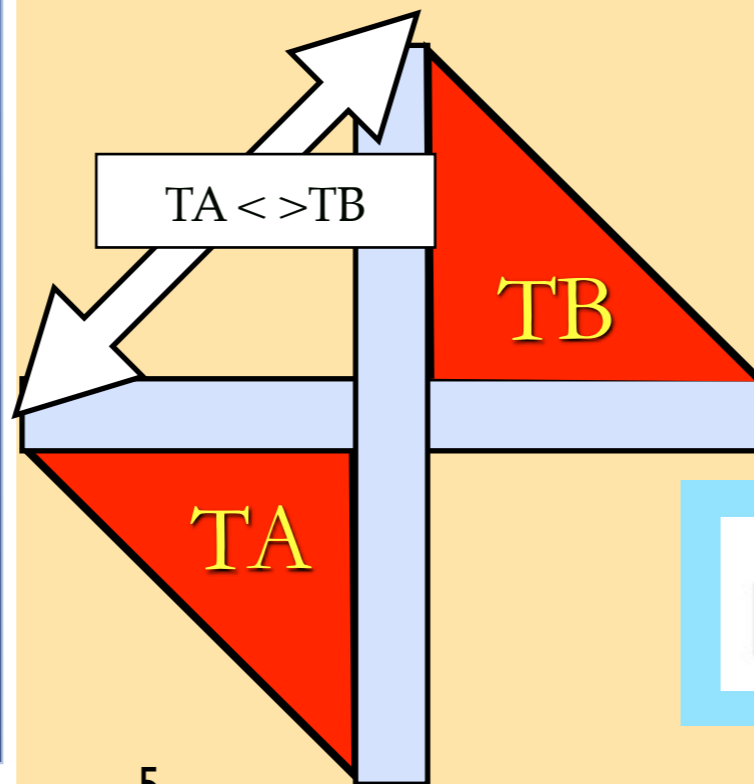| T1 > T2 > T3 > T4 |
|---|

T1

T2

T3

T4
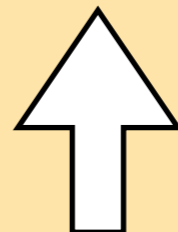
Or other topologies in plant

TA < > TB

TB

TA

5

One Further step:
1. assume a direction **d**;
2. rotate the Detector so to have

d ∥ Z axis

$$\left| (t_i - t_j)\, c - (z_i - z_j) \right| \leq \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2}\ \tan\theta_c$$

but 1 Tower is likely not enough

In **2010** a first kick-off study (only muons no bkg) with the good old 16 floors tower

| SC (20 ns) | SCQ2 (20 ns + ≥ 2 p.e.) | SCQ3 (20 ns + ≥ 3 p.e.) | SCPMT (SC in 20 ns + PMT in 60 ns) | DSC (2x SC i 20 ns entro 400 ns) |

Legend:
- SC
- SCQ2
- SCQ3
- SCPMT
- DSC
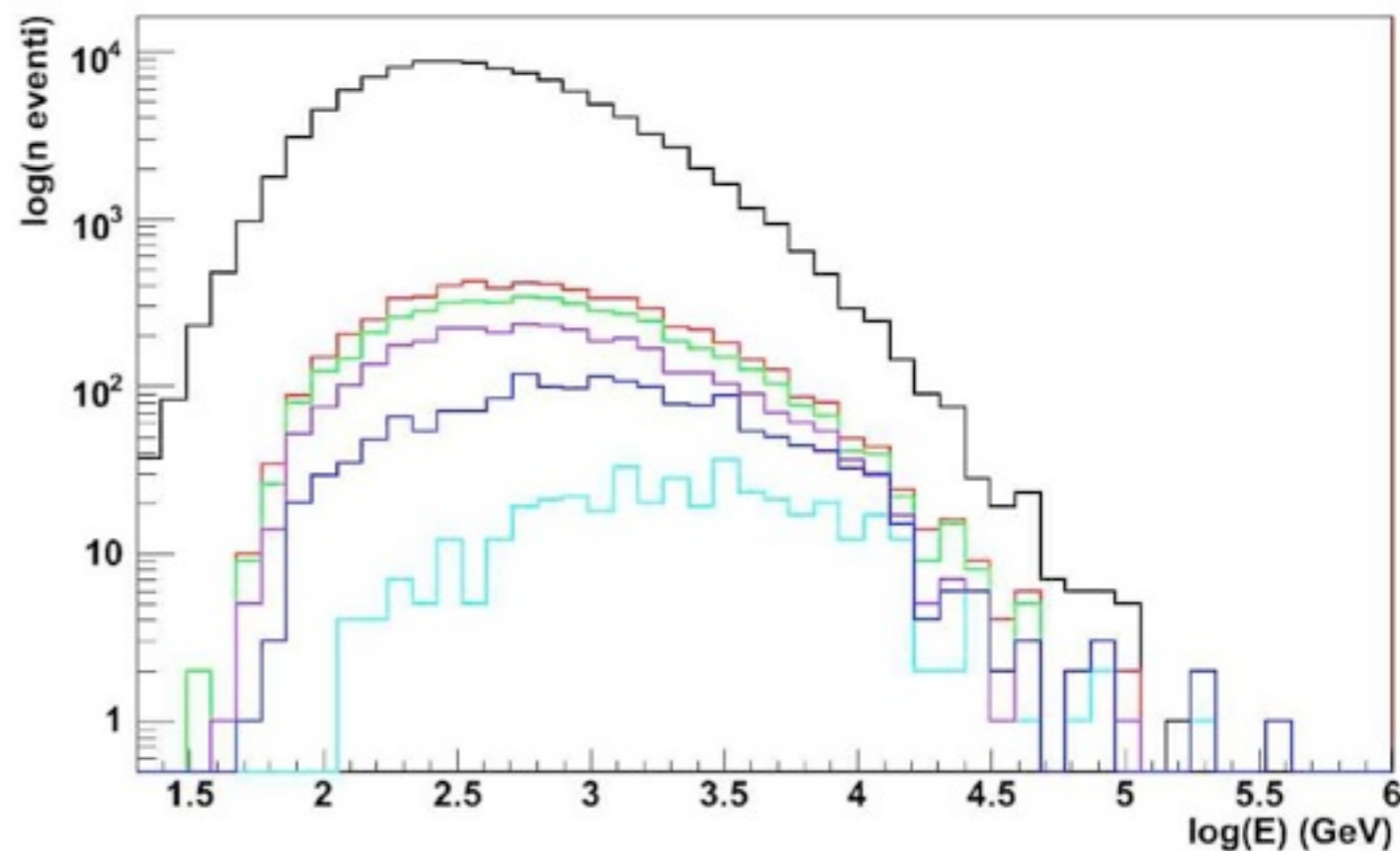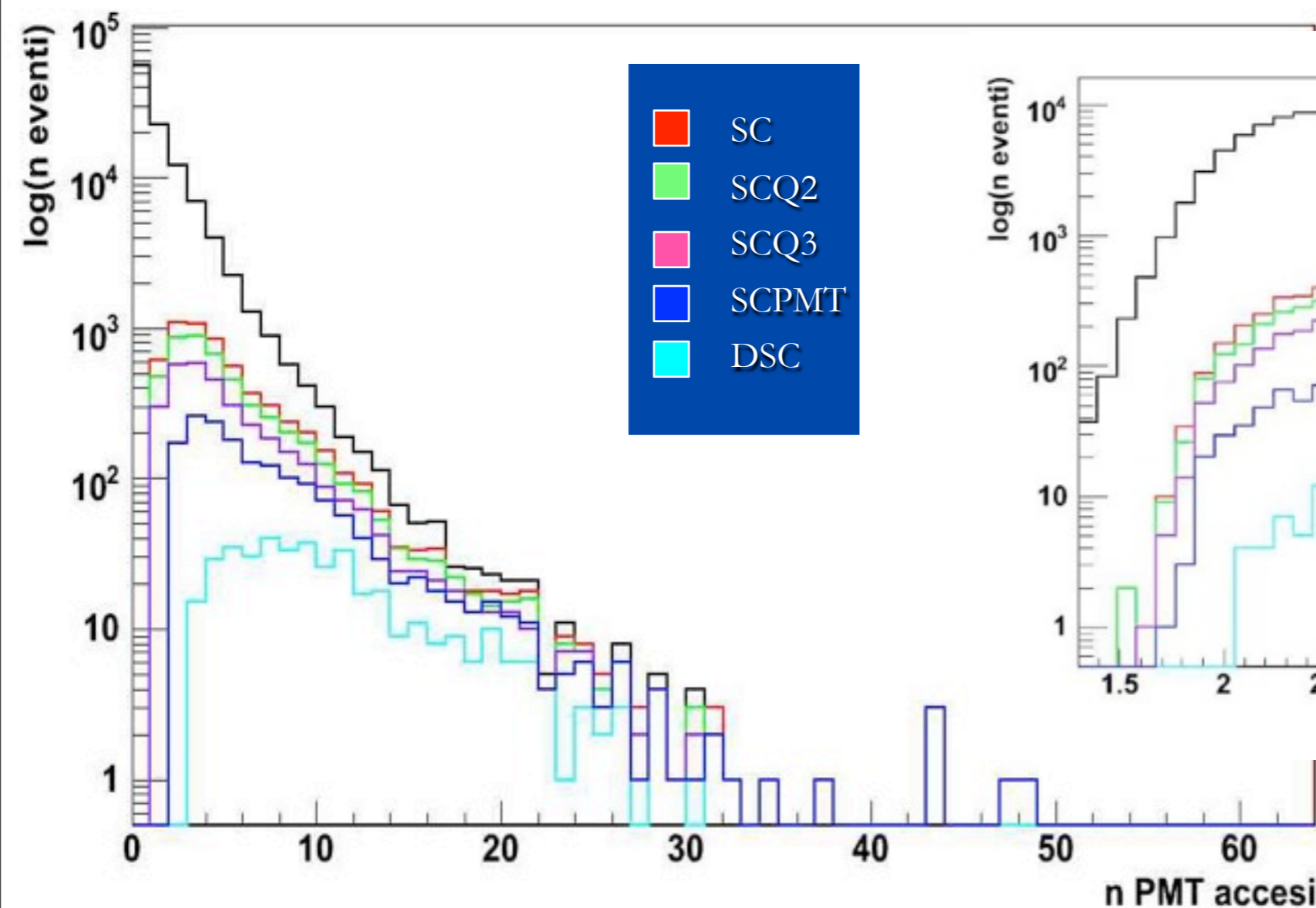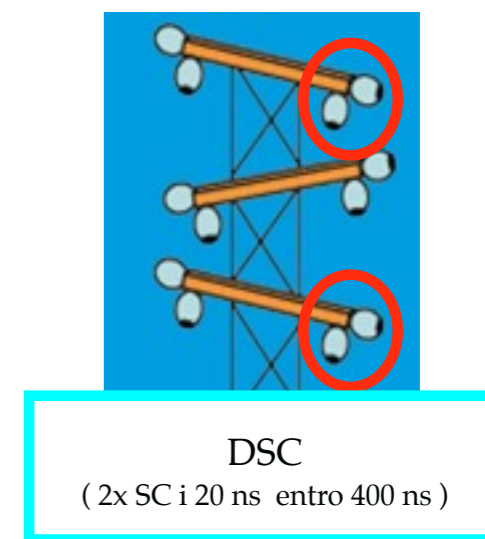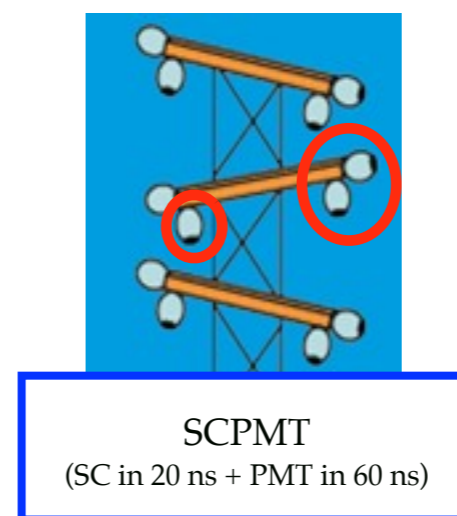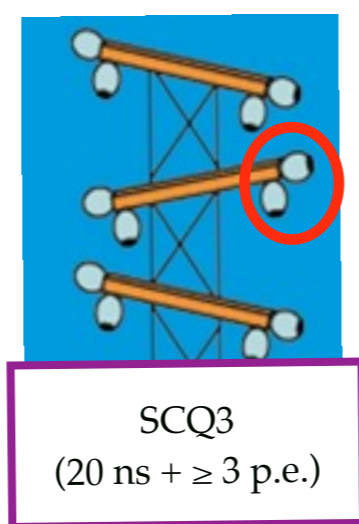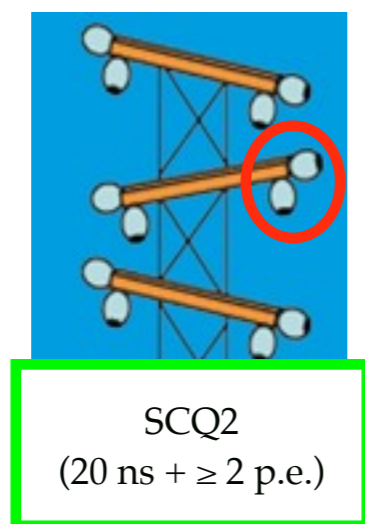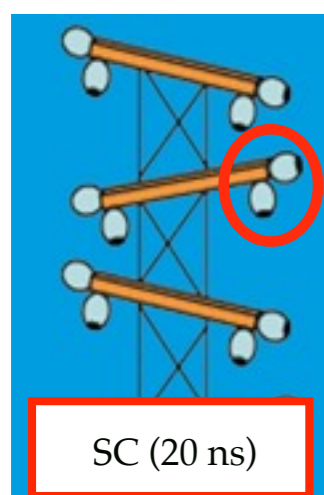
T. Chiarusi   Nemo TB 31/3/**2010**

Sequential algorithm

T. Chiarusi   Nemo TB 31/3/**2010**

compare to previous plot: seq. algo is slightly more selective than SCPMT and twice more efficient than DSC
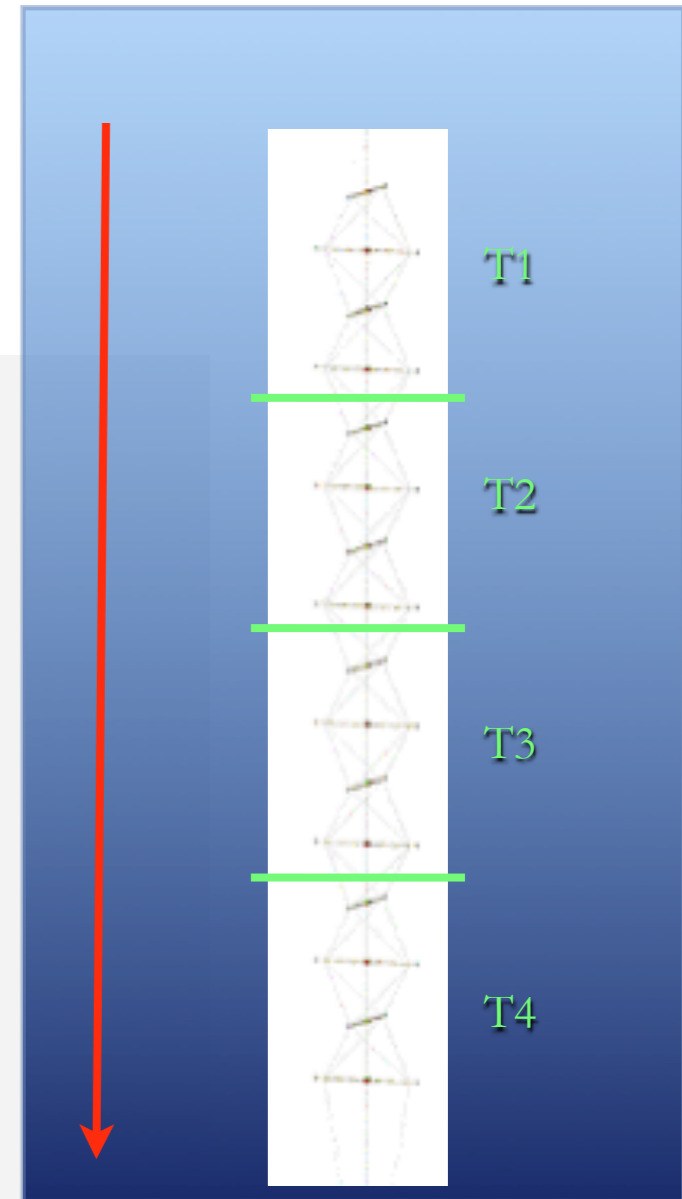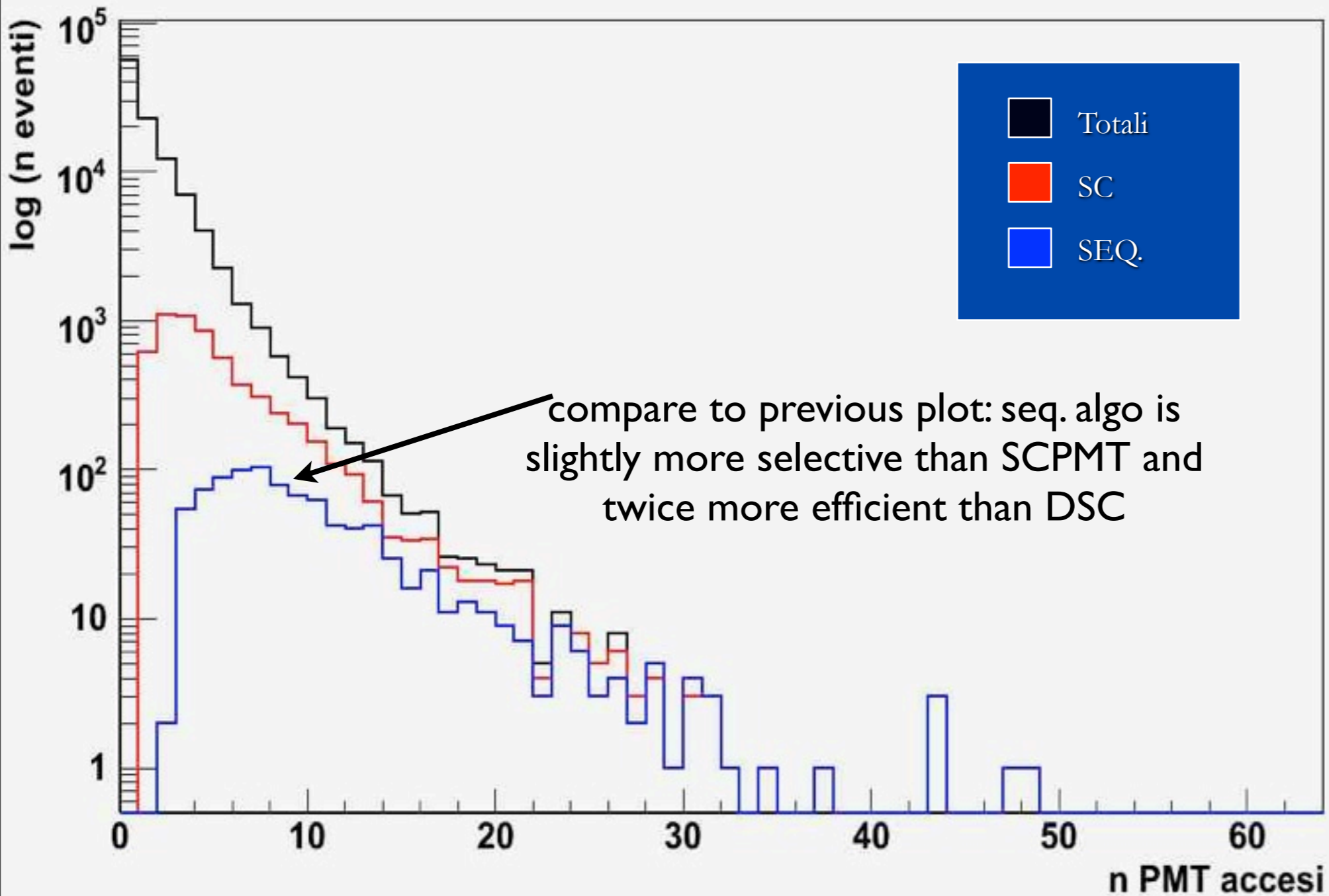
T1 < T2 < T3 < T4

In Bologna we started a new MC production

with L. Fusco and A. Margiotta

MUPAGE config

Zmin   -200.   # minimum z in m
Zmax   400.   # maximum z in m
CANr   225.   # can radius in m
EnlargedCANr 100.0   # meters to add to the can radius

Emin   0.004   # minimum energy in TeV
Emax   1000.0   # maximum energy in TeV

MULTmin   1   # minimum multiplicity
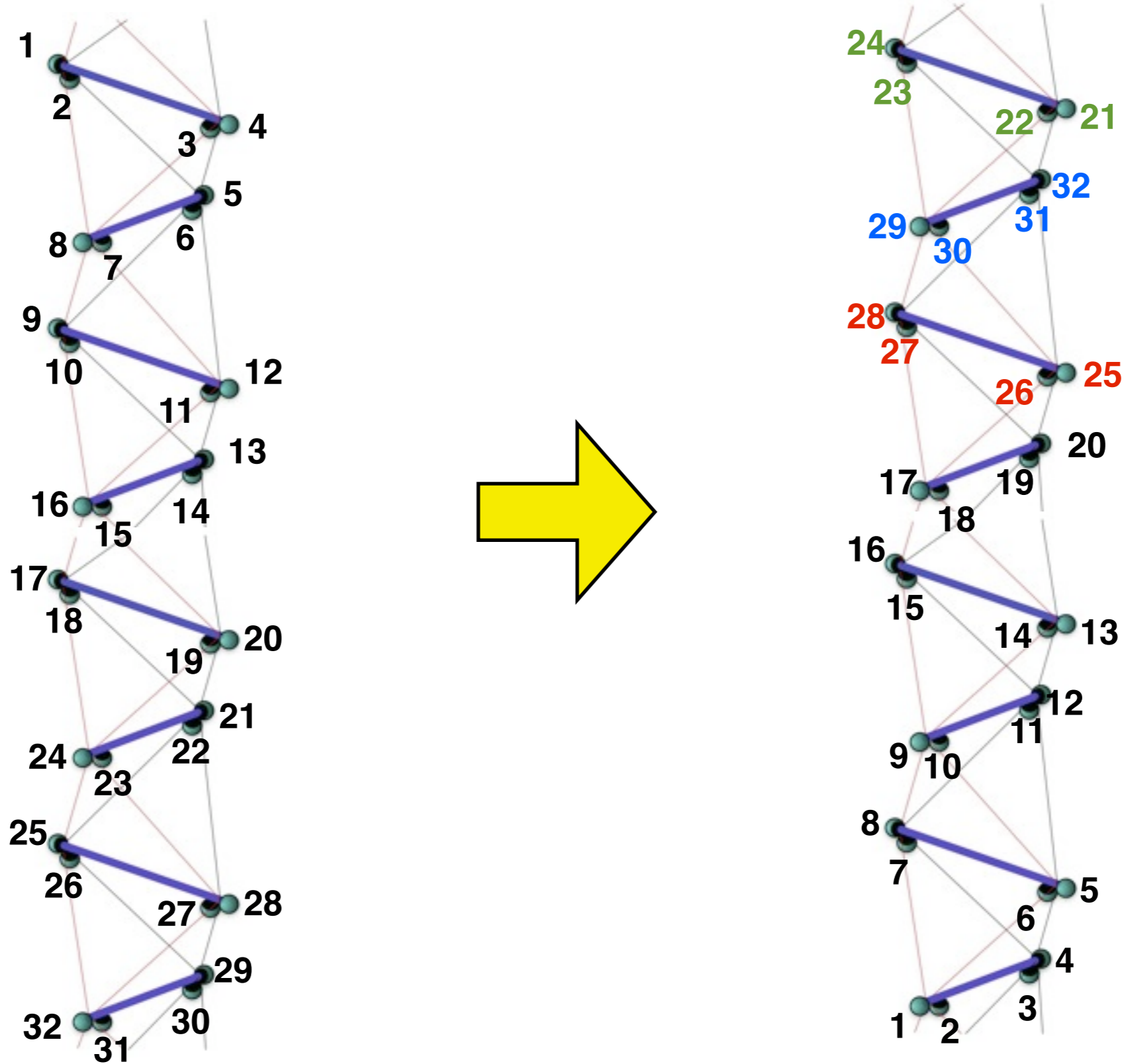MULTmax   200   # maximum multiplicity

- Produced **1000 atm. muon files** @ the CAN;
- # events / file : **100k**
- File livetime = **1.03 10^3 s**
- Total Live Time: ~**11d 22h**

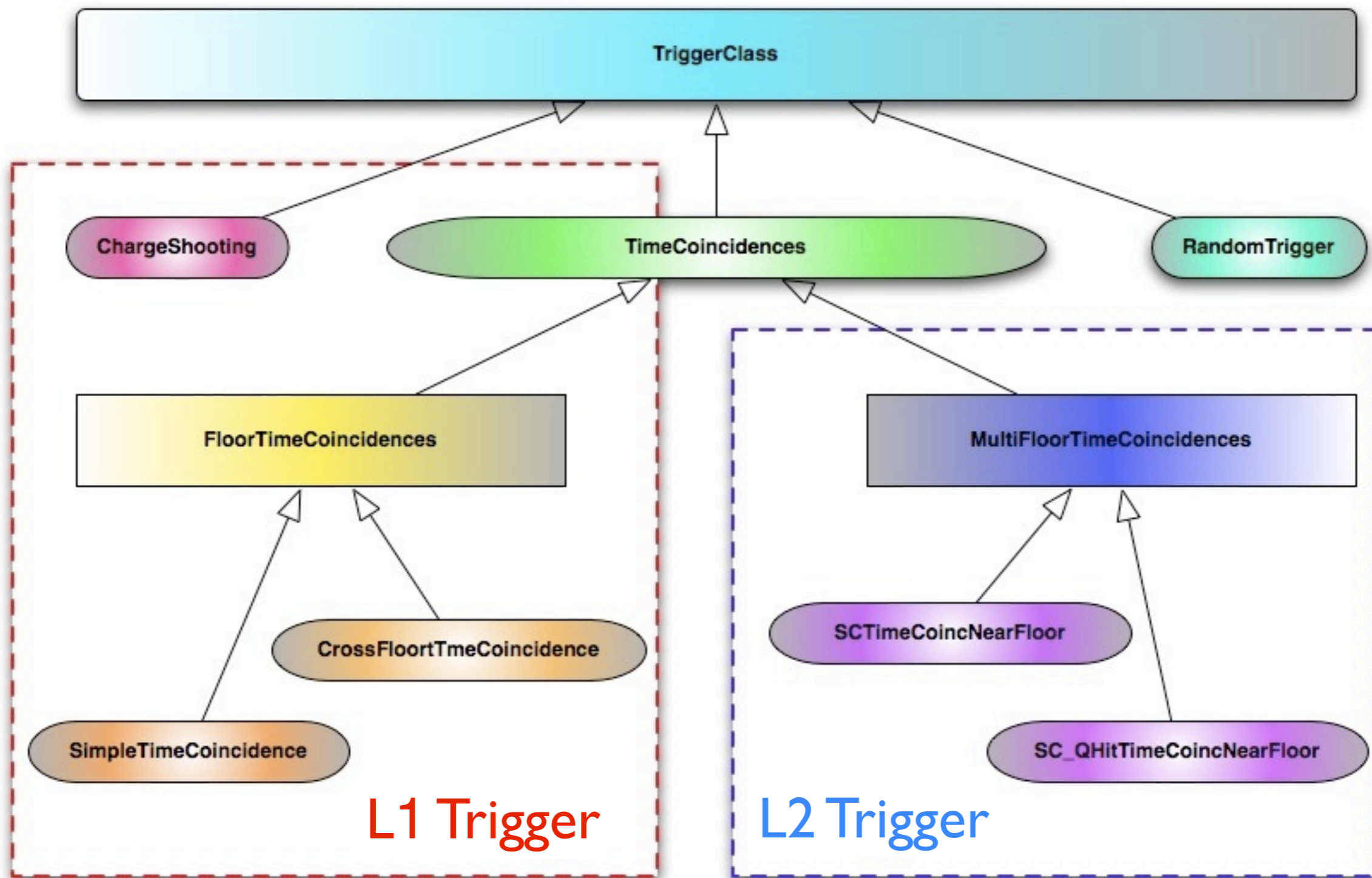# Manually reconfigured the Geometry file

Waiting for Capo Passero water tables used by KM3

Offline Trigger inherited from Phase1

Warning: THE CLASSES MUST BE REVISED

TriggerClass

ChargeShooting
TimeCoincidences
RandomTrigger

FloorTimeCoincidences
MultiFloorTimeCoincidences

CrossFloortTmeCoincidence

SimpleTimeCoincidence

SCTimeCoincNearFloor

SC_QHitTimeCoincNearFloor

L1 Trigger

L2 Trigger

Summary

- Trigger On-line is configurable (within the TriDAS frame = Timeslices segmentation)

- Trigger Off-line needs to be customized accordingly (authors must accomplish off-line frame)

- Trigger studies started, simulations required

- muons should come after

SPARES

Then, L1 window can be submitted to L2 trigger plugins

with G. Terreni (Pisa)

primary seed

secondary seed

selected hit

discarded hit