TriDAS offline

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Outline

- (Quick) overview of the NEMO Phase-II simulation chain
- Why TriDAS offline?
- Further developments for simulations

The MC chain

Atmoph. Muon Generator

Propagator and Light Simulator

Background Simulator

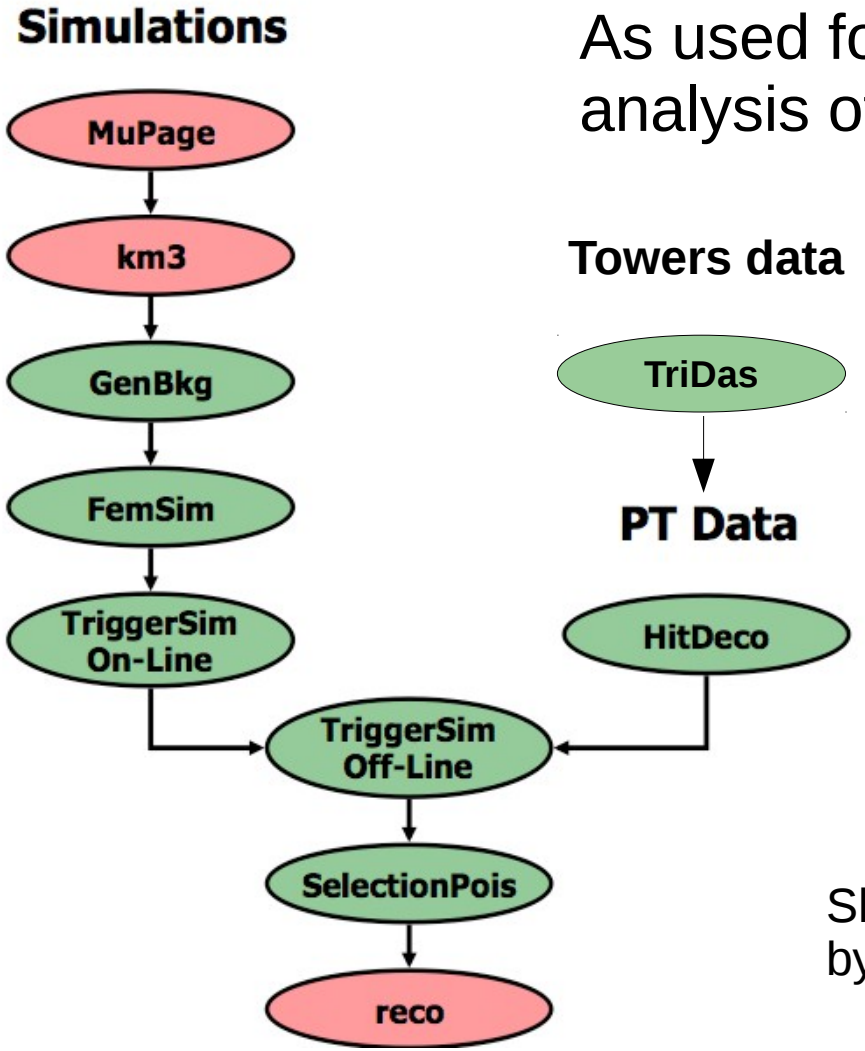
Electronics Simulator

OnLine Trigger Simulator

OffLine Trigger Seeds

Evt Selector (OffLine Trigger Condition + Causality Filter)

Track reconstructor



As used for the muon analysis of Phase2

Shown yesterday by Carla

See http://wiki.infn.it/cn/csn2/km3/monte_carlo

The MC chain

- The weak point of the simulation chain was TriggerSim On-Line:
  - Modifications applied to the TriDAS code during acquisition needed to be ported on a different code;
  - Implementation of TriDAS features was not straightforward;
  - Difficult scalability with a larger detector.

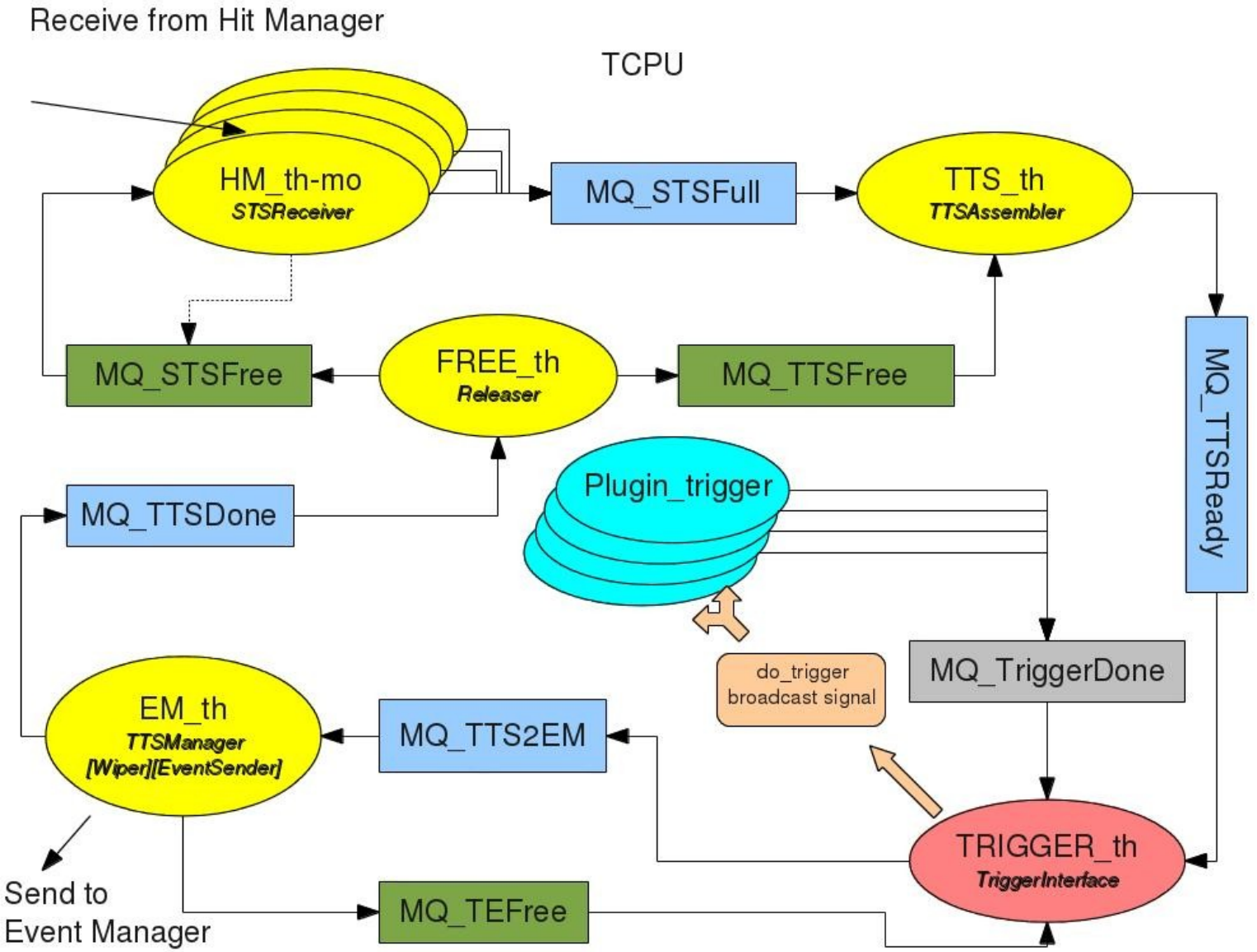
- The solution is to use TriDAS both for the online Towers data acquisition and for its own simulation:
  - Read simulated data directly with the TriDAS;
  - Let the TriDAS do the triggering as if they were real data from the towers;
  - As scalable as the TriDAS is.

The TCPU

- Idea: use the TCPU for simulated data acquisition
  - See M.Manzali's presentation on TriDAS for an overview on the TCPU

- Choose an entry point for simulated data in the TCPU and then let it work and wait for its output

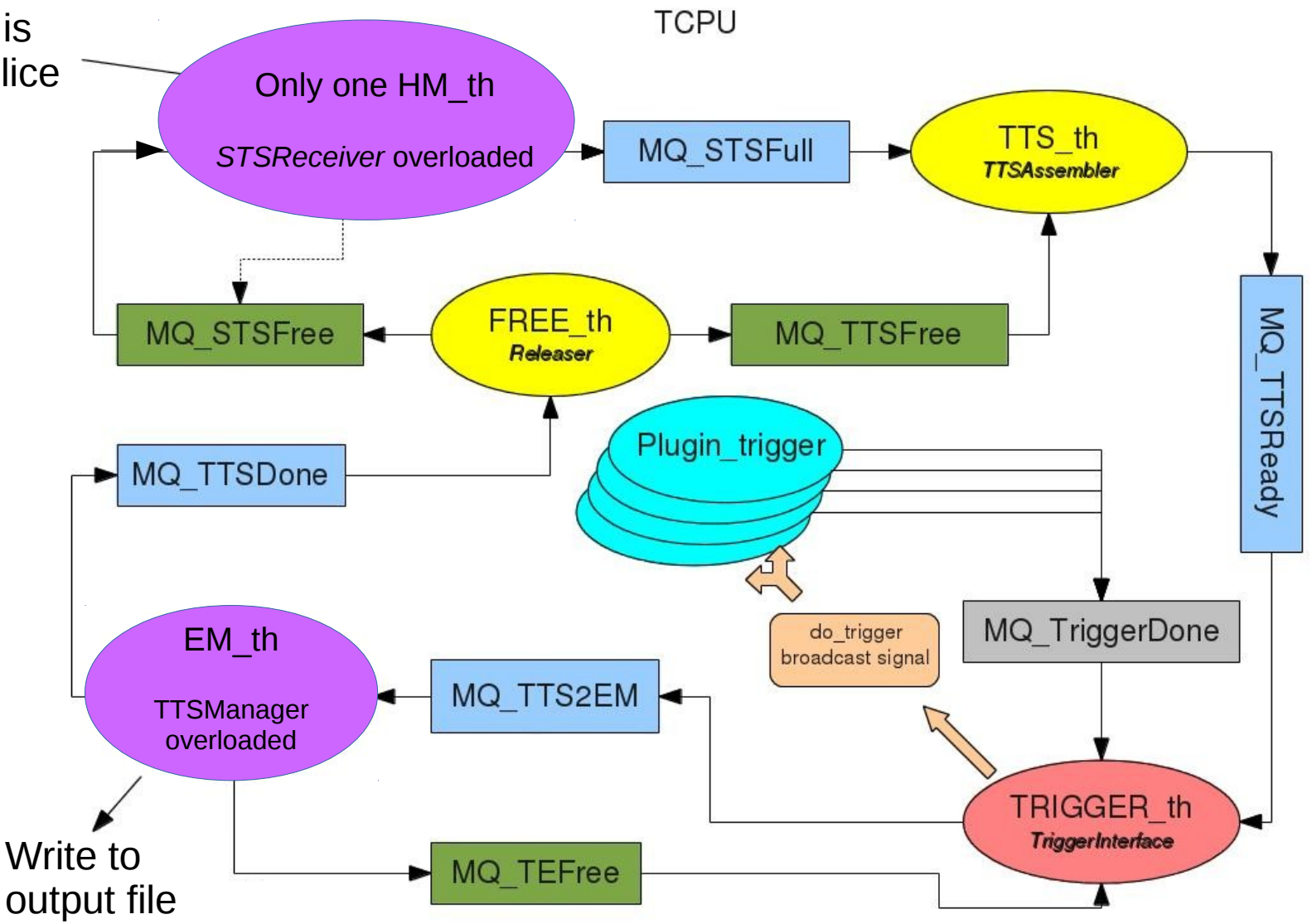
The TCPU for “online data”



The TCPU for “offline data” - beta version

FEMSim ASCII files

1 event is
1 Timeslice



The TCPU for “offline data” - beta version

- ***STSReceiver*** overloaded
  - Can be used on simulated data given a FEMSim input file
    - Datacard value to be set on ONLINE/OFFLINE
    - Input file set in the Datacard
  - Parsing of the ASCII file containing hits from FEMSim
    - Converted to Phase 3 data format (time, samples etc...)
    - 1 event from simulation corresponds to 1 *TelescopeTimeSlice*
  - Creation of all the requested *SectorTimeSlices*
  - As all the hits in the event are processed and STS are created, move to the next event
    - TTS put in the queue, waiting for the *TriggerInterface* to process it

READY

The TCPU for “offline data” - beta version

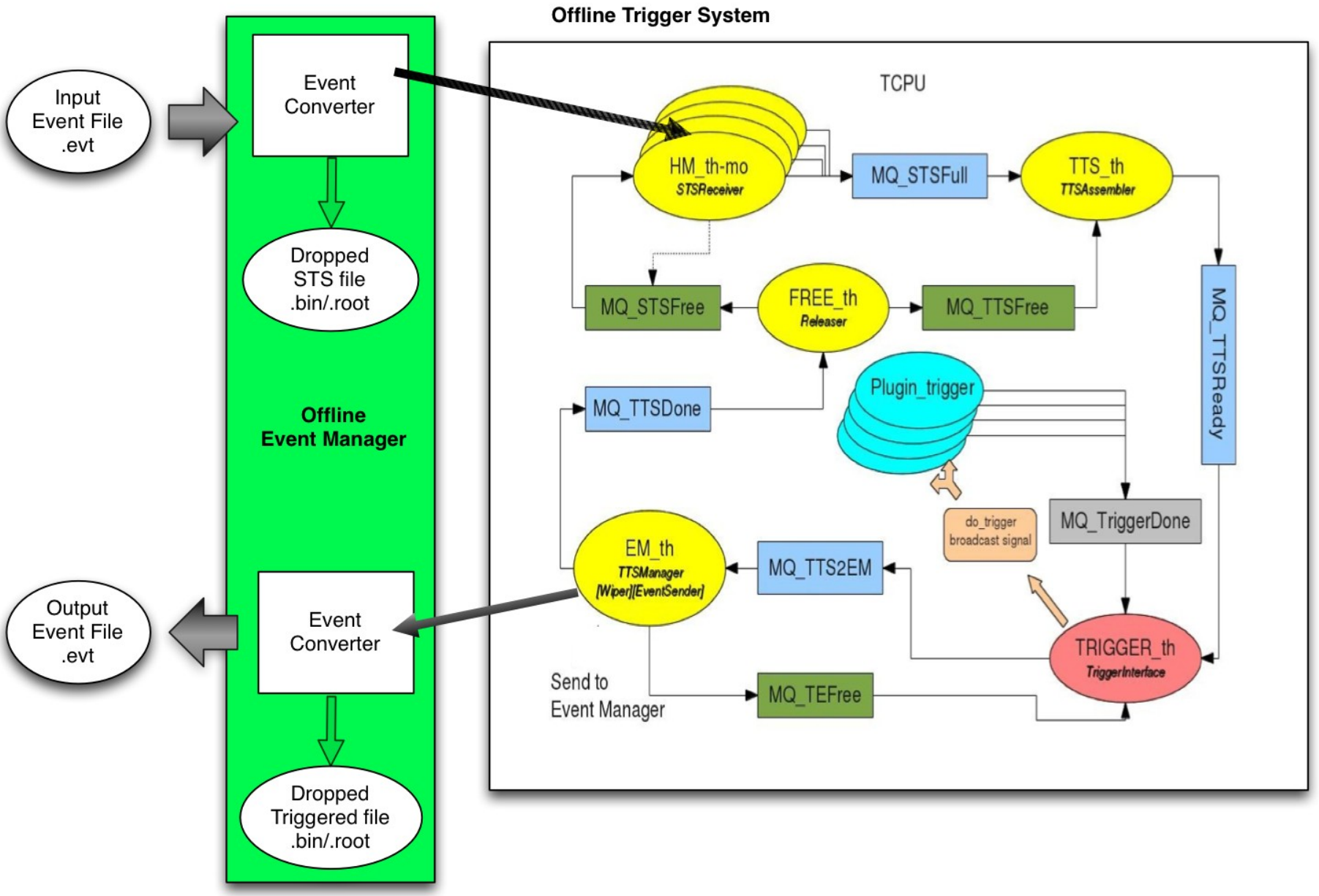
- ***TTSManager*** overloaded
  - Prepare the output to be read by the user
  - Keep track of the MonteCarlo information for the event
  - Keep informations from the previous steps of the simulation (as currently done)
- What informations are to be kept?
- What format? ASCII .evt or .root or binary .dat file?

SUPERSEDED

The new TriDAS “offline”

- New design of the overall design for offline data treatment – proposed and to be arranged by C.Pellegrino.
- **offline Event Manager** (oEM):
  - External process “simulating” the HM (reading .evt files and creating STSs – instead of the overloaded STSReceiver);
  - Feeding the TCPU with the obtained STSs;
  - Accepting the post-processed TTS;
  - Taking care of producing a “readable” output – the input .evt file will be updated with the informations from the TCPU processing;
  - Dumping (on demand) binary files – HM format or TCPU output format.
- Exactly the same TCPU for online and offline (no overloading of methods, no “double” maintenance etc.)

The TriDAS “offline”



MC studies

- Having a TriDAS working for both simulations and real data, trigger studies can be easily produced, for every algorithm:
  - Efficiency
  - Purity
  - Whatsoever...

- Possible to write trigger algorithms without any porting from data to simulations (and viceversa)
  - Written the plugin, it then works on both

Conclusions and outlook

- TCPU modified to analyze simulated data:
  - Further final developments arriving
- Same TriDAS version for real data and simulations
- Soon ready to be applied on simulations