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# KM3NeT phase-1 TOWER SIMULATION

# Monte Carlo tower simulations Chain

Atmoph. Muon Generator

Propagator and Light Simulator

Background Simulator

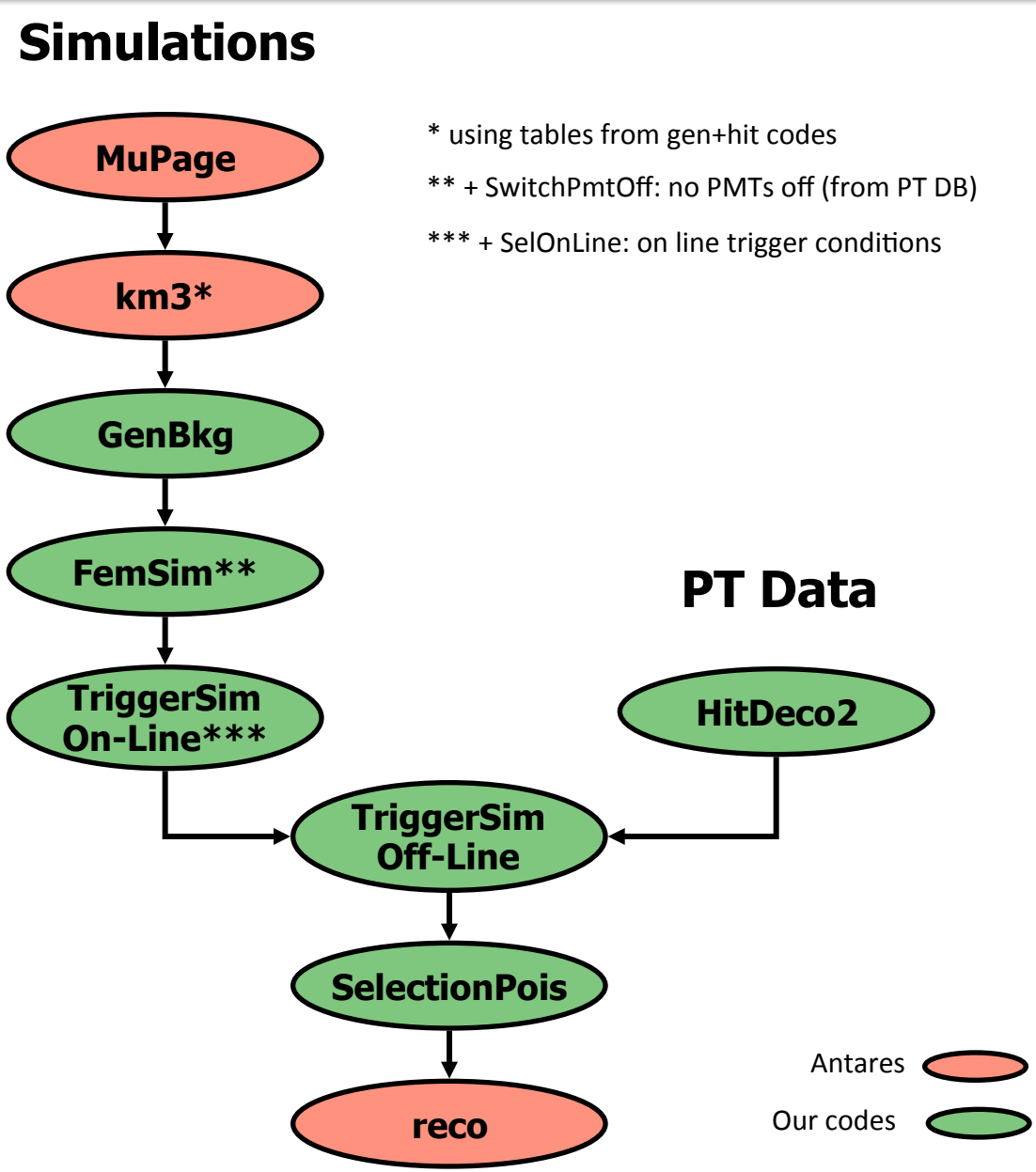
Electronics Simulator

OnLine Trigger Simulator

OffLine Trigger Seeds

Evt Selector (OffLine Trigger Condition + ~~Causality Filter~~)

Track reconstructor



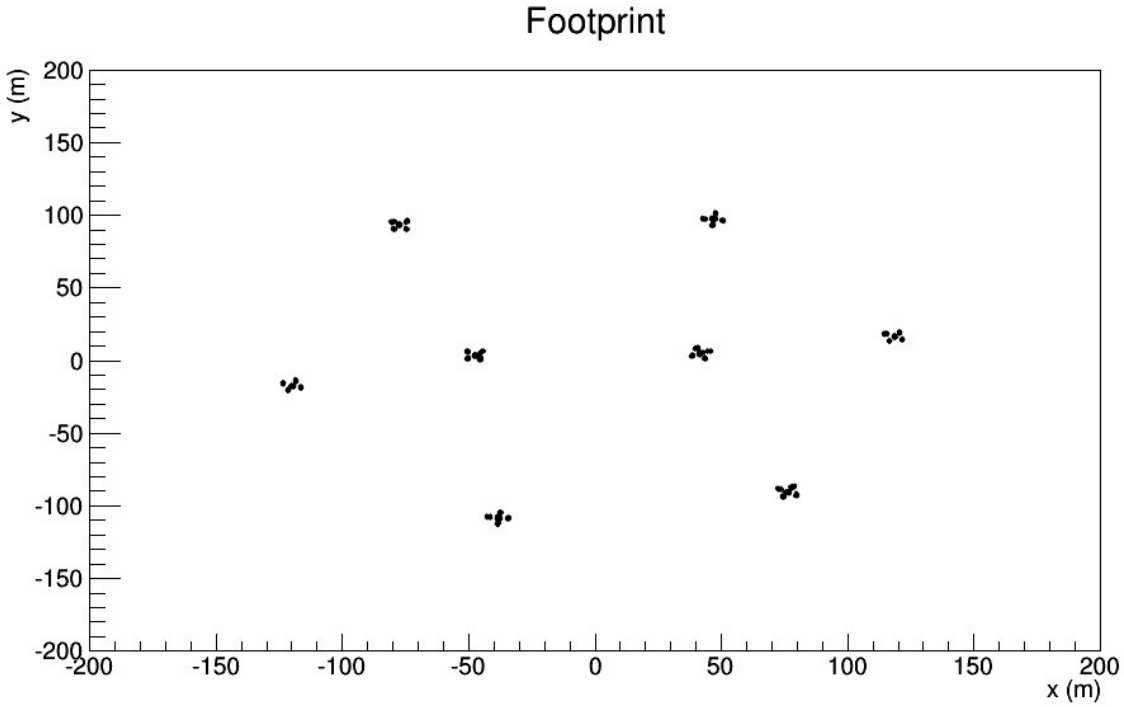
## Outlook of KM3NeT-it phase-1 tower simulation:

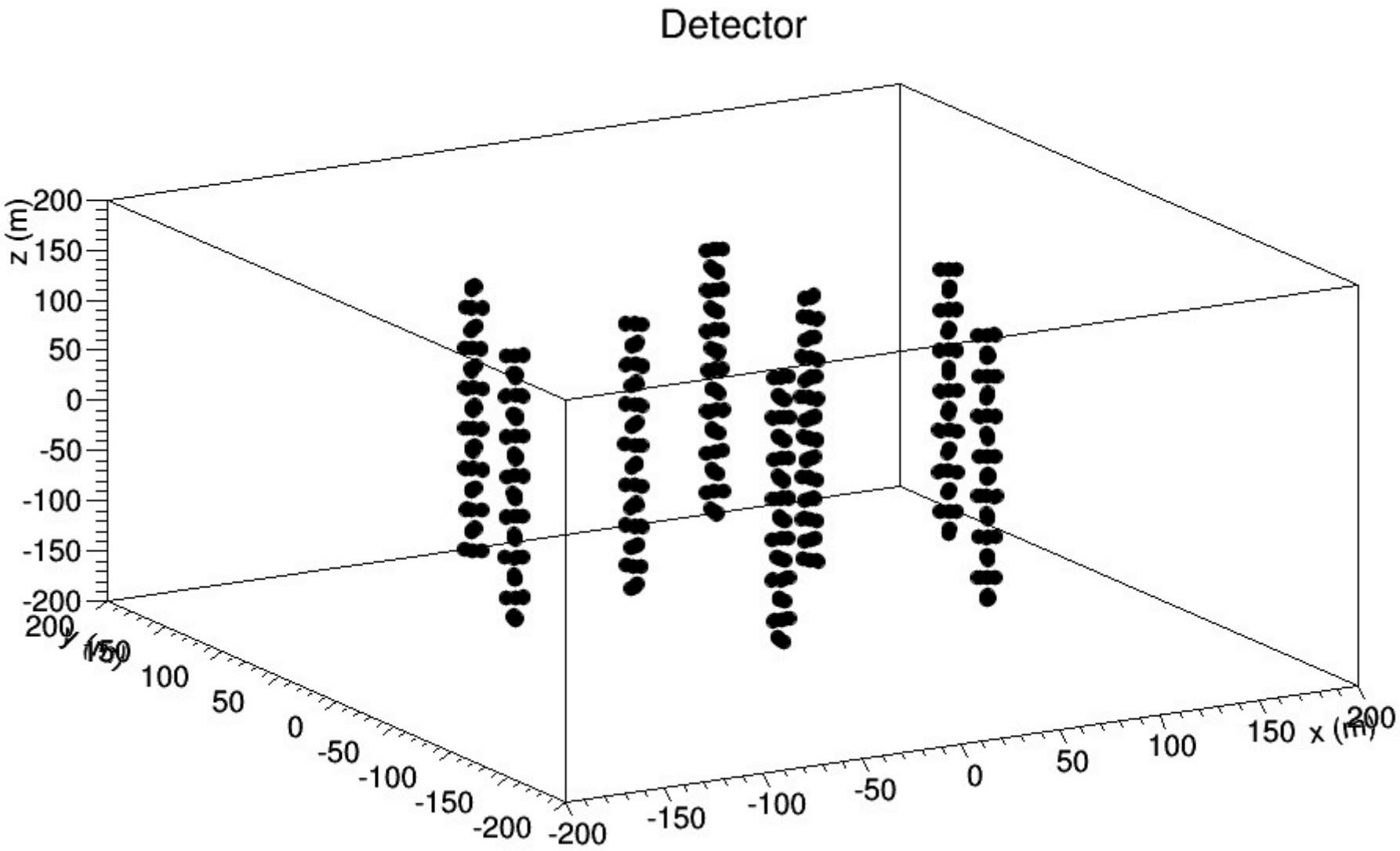
- **Detector Geometry Simulation: Gendet**
- **Neutrino and Atmospheric Muon Generation: Genhen, Mupage**
- **Light and PMT Simulation: KM3**
- **GenBkg: work in progress …**

# Detector Geometry

GENDET v1r3

- 8 towers at the depth and coordinates of the Capo Passero site
- 14 floors for each tower
- Floor length 8 m
- Distance between adjacent floors 20 m
- 6 PMTs in each floor




Detector
z (m)
200
150
100
50
0
-50
-100
-150
-200
y (m)
200
150
100
50
0
-50
-100
-150
-200
x (m)
-200
-150
-100
-50
0
50
100
150
200

## Neutrino Generation

GENHEN v7r3: nu and antinu evt files in
/sps/km3net/users/gferrara/antares_km3/evt/towers/gen

## Atmospheric Muon Generation

MUPAGE v3r4he: atmospheric muon with $E_{bundle} > 10$ TeV.
MC evt files will be stored in
/sps/km3net/users/gferrara/antares_km3/evt/towers/gen/mu_atm

Same detector geometry used for neutrino production

# Light and PMT Simulation

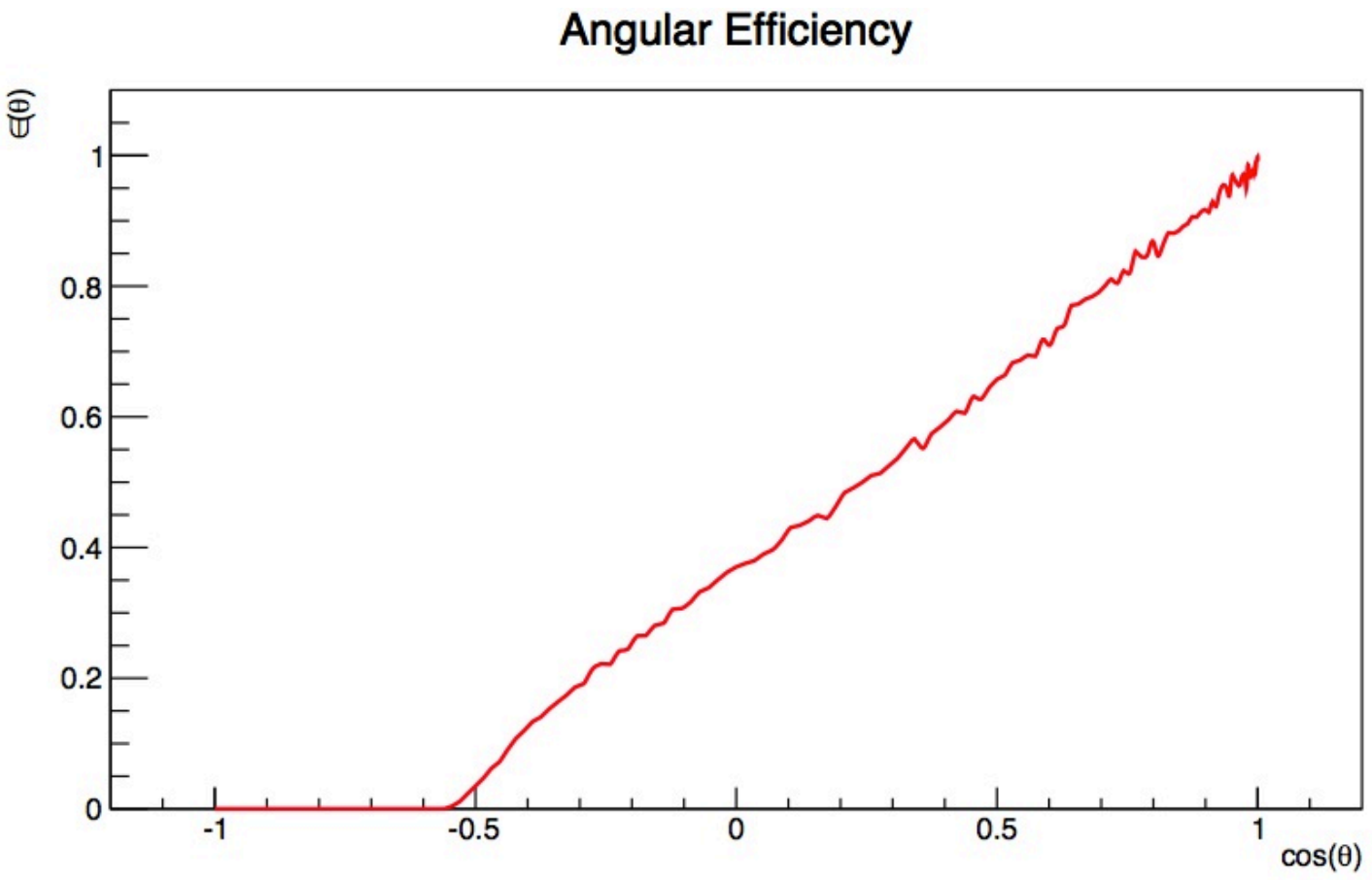
KM3 v5r2: nu and antinu evt files in
/sps/km3net/users/gferrara/antares_km3/evt/towers/km3

- Photon tables from last version of GEN: same water model of KM3NeT production
- Generation of *hit probability distribution* in the PMTs with HIT taking into account the PMTs features (see table below)

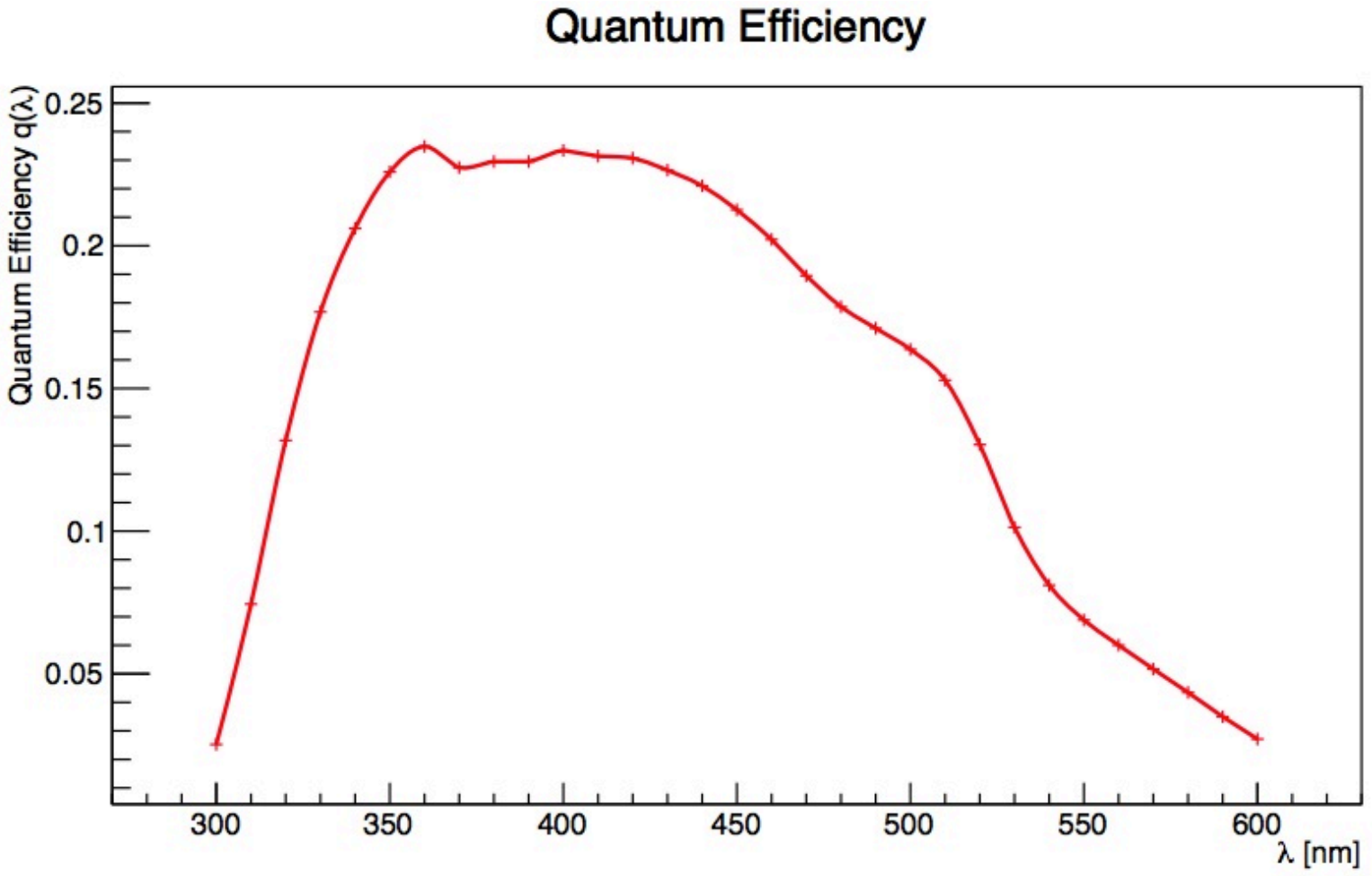
**PMT parameters used by HIT:**

| r [inches] | Efficiency factor | $t_{gel}$ [cm] | $t_{glass}$ [cm] |
|---|---|---|---|
| 9.3'' | 0.9 | 1.0 | 1.2 |

## Angular efficiency used by HIT:



## Quantum efficiency used by HIT:

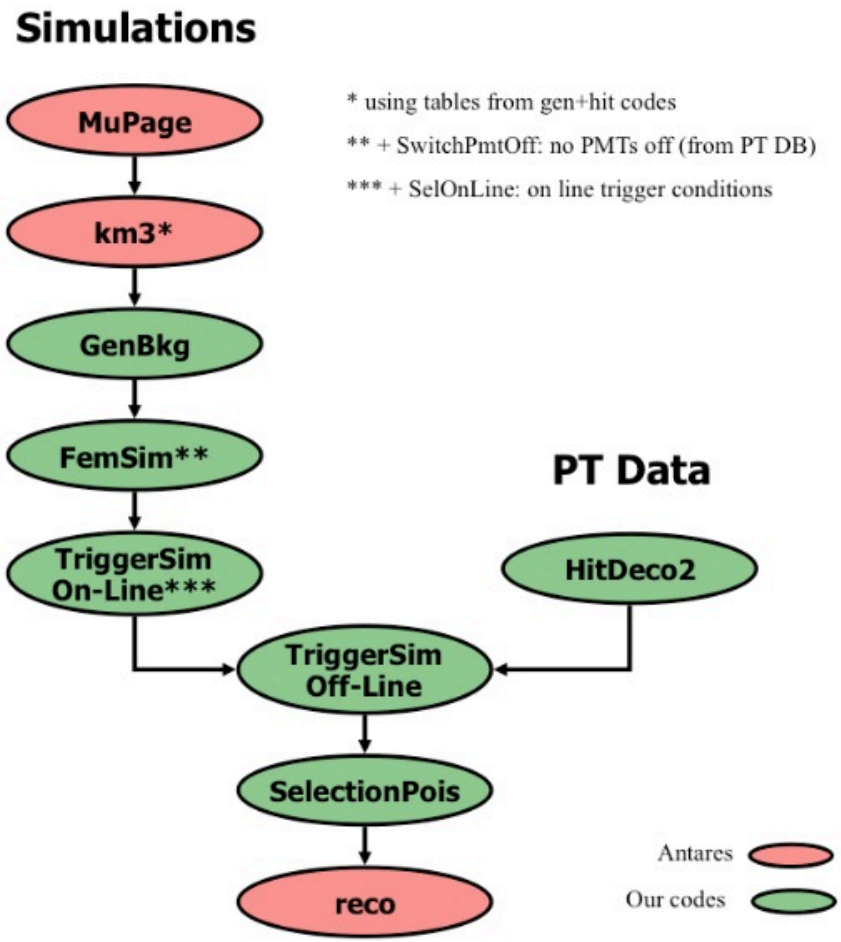


# MC tower simulation chain is on going with the further steps

- GenBkg: work in progress…

- FemSim: should be the same of previous simulations

- TriggerSim On-Line: should be changed?



**Thanks for the attention**