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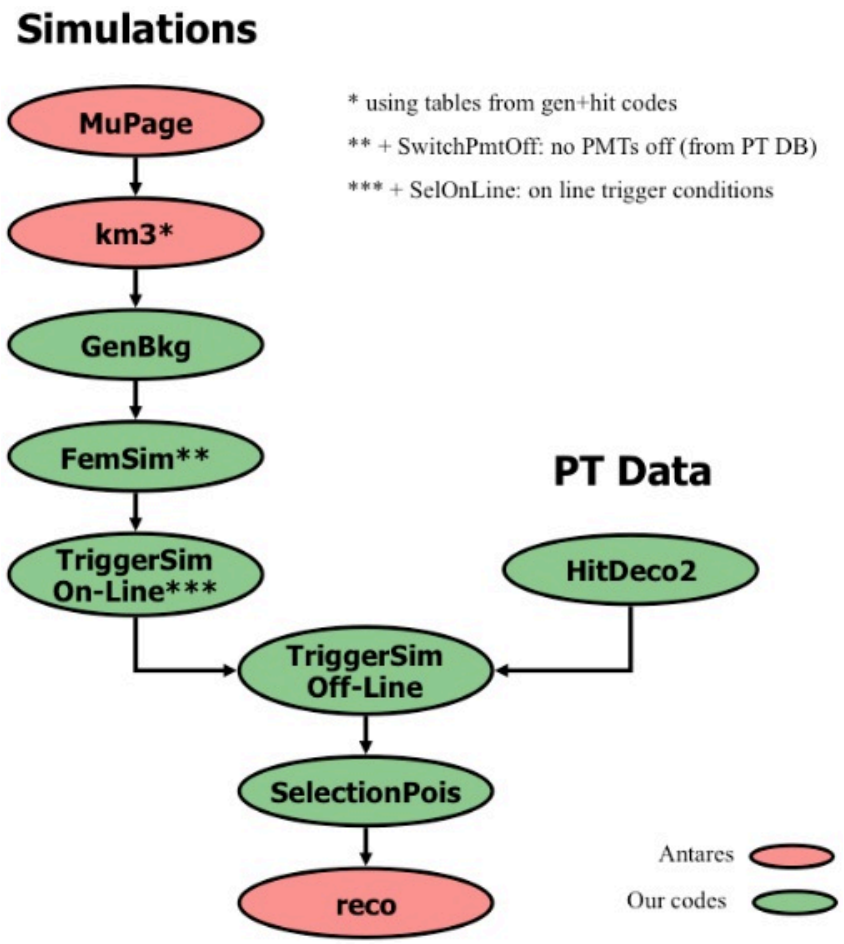
KM3NeT phase-1 TOWER SIMULATION

Outlook of KM3NeT phase-1 tower simulation:

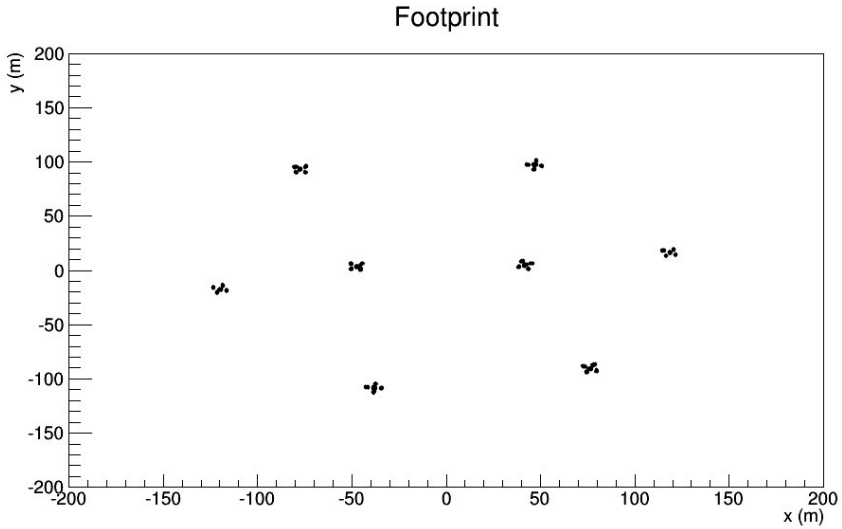
- **Detector Geometry Simulation: Gendet**
- **Neutrino and Atmospheric Muon Generation: Genhen, Mupage**
- **Light and PMT Simulation: KM3**
- **Optical Background Simulation: GenBkg**
- **Electronics Simulation: FemSim**

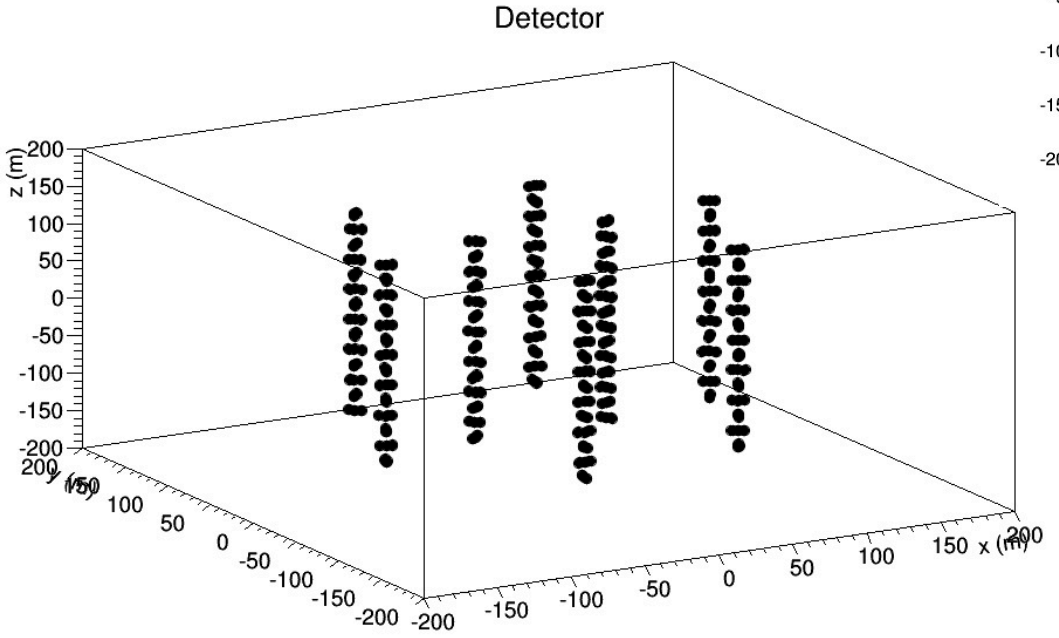


Detector Geometry: 8 Towers

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 file in
/sps/km3net/users/gferrara/antares_km3
/evt/towers/km3it8t_10dh6pm90_142010.det

Atmospheric 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 are 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

Optical Background Simulation: GenBkg Code

GenBkg adds optical background to events.

Options used are the same of NEMO Phase 2:
- Strategy s1: s.p.e hits according to a constant hit rate
- Time Window: 6μs
- Optical background: 52kHz

GenBkg: nu, antinu and mu atm evt files are in
/sps/km3net/users/gferrara/antares_km3/evt/towers/GenBkg

Front-End Module Simulation: FemSim Code

Default Options:
- IntWin 75ns;
- Charge s.p.e in pC;
- TimeSD 0.3ns, ChargeSD 0.3;

FemSim files in
/sps/km3net/users/gferrara/antares_km3/evt/towers/FemSim

Tower Simulation: same of 8 towers simulation

- Detector Geometry Simulation: Gendet

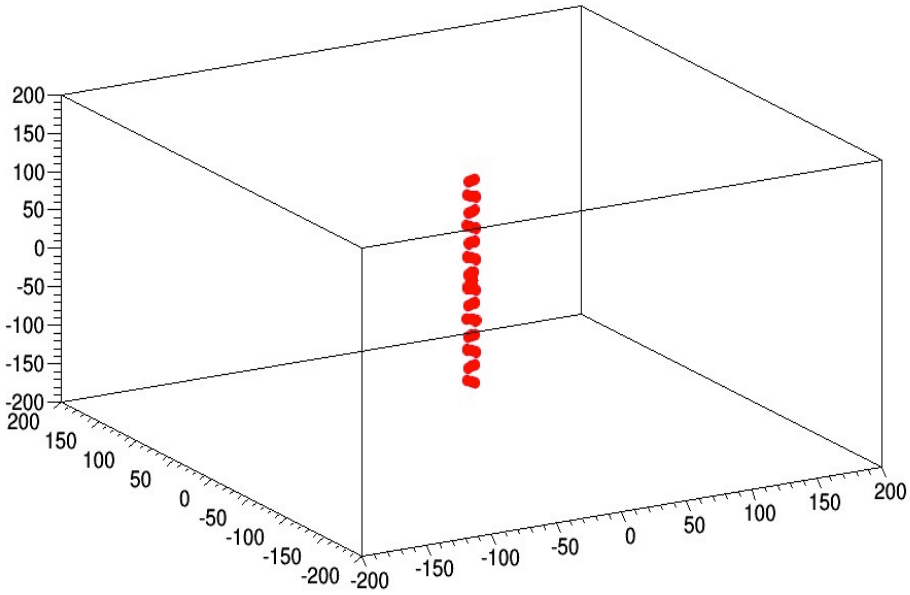
  Detector file in:
  /sps/km3net/users/gferrara/antares_km3
  /evt/Tower/km3it1t_10dh6pm90_142010.det

- Neutrino and Atmospheric Muon Generation: Genhen, Mupage

- Light and PMT Simulation: KM3

- Optical Background Simulation: GenBkg

- Electronics Simulation: FemSim

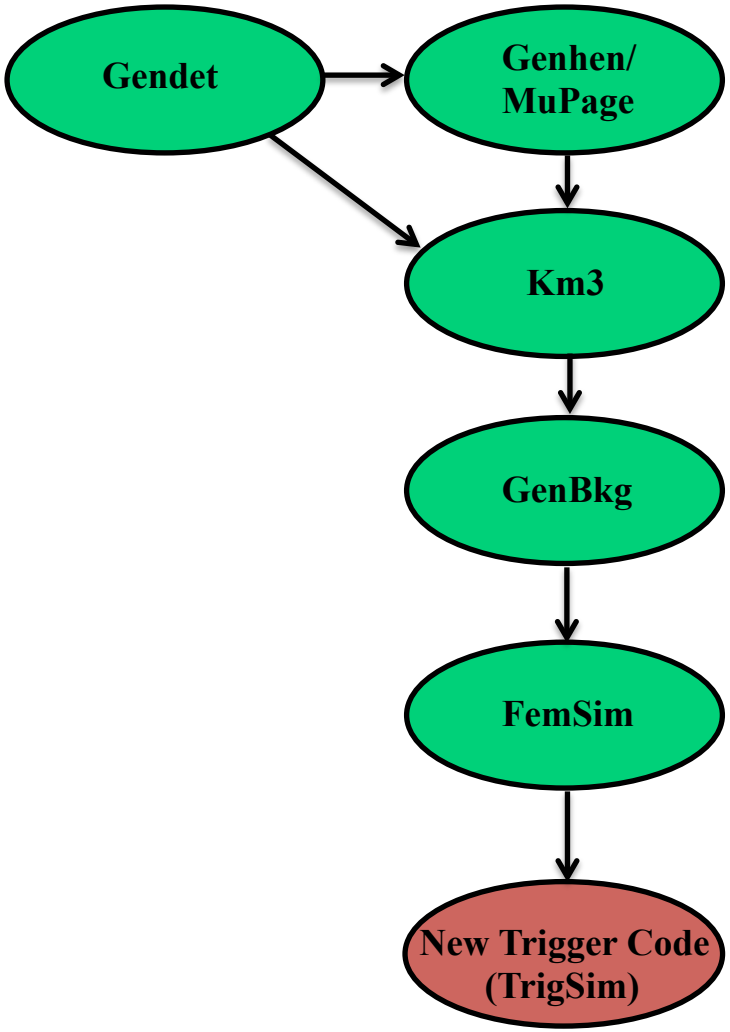


Event files in:
/sps/km3net/users/gferrara/antares_km3/evt/Tower

Trigger Simulation:

- No TriggerSim Code
- New code for trigger simulation:
  TrigSim implemented by C. Pellegrino

…waiting for the new Trigger Simulation Code available very soon!



Further steps:

- 8 towers simulation: switch PMT off of 7 towers and compare the results with 1 tower simulation

- Start with the trigger simulation

…thanks!