

EUROnu: activities layout at APC

Software tools developed at APC & LAL:

- Event Generator:
 - **NUANCE** for ν beam, ν Atmospheric & Proton Decay
- Simulation:
 - Version 0:
 - adapted by J.E.Campagne from **Geant 4 code** used by M. Fechner et al. for T2K-WC-2km. The simulation was x-checked using SK & K2K data.
 - includes Water & PMT & wall reflectivity optical parameters
 - Current version 7:
 - Interface with the **OpenScientist v16r0** framework (G. Barrand@LAL)
 - **3 modes of running in the same framework:**
 - Interactive Viewing, Batch processing, AIDA_ROOT analysis
 - Event info from MC
 - Primary + non-Optical photons track infos
 - Hits: each PM maintain a list of arrival time of optical photons detected (i.e photo-cathod efficiency)
- Developments: (work in progress at APC, LAPP)
 - **Code review** to improve the geometry implementation, clean up the patches used to adapt the code from T2K-WC to MEMPHYS use case, improve flexibility
 - Implement the **electronics simulation**
 - Implement a **Data Model** to be able to do “replay” event-display

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MEMPHYS Event Reconstruction

Current work:

- Vertex Fitting :
 - ✓ Point-Fit: done
 - ✓ Ring Edge Search: on-going
 - ✓ TDC-Fit: on-going
- Particle Identification:
 - ✓ Expected Charge Distribution: starting
 - Estimation of Particle Types

Future work:

- Ring Counting
- Precise Vertex Fitting
(only for single-ring event)
- Momentum Determination
- Ring Number Correction
- Decay Electron finding
- π^0 Fitting

Horn & Globes

New Horn (350kA, 2m long) for spl optimized for:

- the new 2λ carbon/graphite from wp2
- meson yield from the above target layout

Globes:

- future analysis for Memphys using SPL & beta-beams @ APC