

CYGNO simulation tasks

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CYGNO simulation meeting

Simulation tasks (1)

1) SRIM

- a) check calculations of the quenching factor made by E. Marconato
- b) introduce effect due to secondary ionization

2) Toy MC

- a) CMOS noise simulation + GEM gain fluctuations + diffusion vs z
- b) PMT simulation

3) Analysis

- a) tune reconstruction parameters for new data in LIME
- b) study reconstruction performance on MC

Detailed discussion on reconstruction and analysis tasks will be moved to analysis meetings chaired by Emanuele

Simulation tasks (2)

4) Neutrons in LIME

- a) MC simulation: Geant4 (energy deposit) + SRIM (NR tracks)
- b) digitization (toy MC) + analysis

5) Neutrinos in CYGNO

- a) MC simulation: Geant4 ER tracks
- b) digitization (toy MC) + analysis (directionality studies)
- c) sensitivity study

6) Dark matter in CYGNO

- a) MC simulation: SRIM NR tracks
- b) digitization (toy MC) + analysis (ER rejection study)
- c) sensitivity study

Tasks & people

1. SRIM → André and Flaminia with Davide coordination
2. Toy MC → Atul and Mariana with Fabrizio and Giulia coordination
3. Analysis → Samuele and Atul with Emanuele coordination
4. Neutrons in LIME → Flaminia with Elisabetta coordination
5. Neutrinos in CYGNO → Samuele and Giorgio with Elisabetta coordination
6. Dark matter in CYGNO → Giorgio with Elisabetta coordination

7. Bayesian tool for limits and sensitivity → Giorgio and Stefano with Andrea coordination

Code & tools

- SRIM download page: <http://www.srim.org/SRIM/SRIMLEGL.htm>
- GEANT4 CYGNO simulation: <https://github.com/CYGNUS-RD/CYGNO-MC>
- Toy MC: <https://github.com/CYGNUS-RD/digitization>
- CMOS noise simulation: <https://github.com/ranobr/cygn-noise-simulation>
(to be moved to CYGNUS-RD github area)
- Reconstruction code: <https://github.com/CYGNUS-RD/reconstruction>