

Electromagnetic & Hadronic Physics Requirements

Roadmap for detector simulation

- Comprehensive theoretical review of main physics processes both for precision and for extension to higher energies (FCC and beyond) in electromagnetic and hadronic physics (along with a solid validation testing suite).
- Revise algorithm implementations for better performance in full simulation. Improvement of existing fast simulation techniques along with investigating novel approaches in collaboration with experiments.

Electromagnetic Physics:

- Theory-based fluctuation model
- Inclusion of leading & next to leading order corrections
- ...

Hadronic Physics:

- Extension of string models to higher energies and heavier projectiles
- Refinement of low-energy nuclear physics
- ...

Foresight: non-HEP application domains

- There is a growing interest in using Geant4 for medical, space and nuclear physics requiring more investment from the simulation community on subjects such as: Hadron therapy, Activation, Radiation, Shielding, Low-energy nuclear applications. New domains can be explored: Fusion, Ultra high-energy cosmic rays

Resources

- **Given the required efforts, we need *less meetings & more full-time PPY experts in physics simulations in general***
- **For fast simulation, there is need to create strong bonds between experiments and developers**