

Chapter IV: Extensions and Validations



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Introduction

Chapter IV : *Recent Developments in Physics Modelling*

Outline from Paper Committee has four main sections

- Electromagnetics
- Hadronics
- Extensions
- Validations

Last two items left *undefined*, for discussion here

Some ideas and questions presented here, need Collaboration input

Extensions to Physics Modelling

Should cover new features since 2006, not included in EM or Hadronics

- Potential huge collection of topics!
- Broad areas of “new” physics
- Interfaces to external codes
- How do we reasonably limit coverage?

Model improvements within EM, Hadronics should be covered in those sections (**IV A**, **IV B**)

New physics areas should have sections in Chapter IV

Non-physics areas should have sections in Chapter III

New Physics Areas

G4DNA (Microphysics) : EM, or separate section?

G4CMP (Lattices, Phonons) : Separate paper?

Biasing : Chapter IV or Chapter III section?

Medical Applications : How detailed?

Space Applications : How detailed?

Should planned future extensions (e.g., neutrinos) be mentioned?

Non-Physics Extensions

Visualization : Already in **III C**

Analysis Tools : Should be in Chapter III?

GDML, ASCII geometry : Covered in **III B**?

Other new areas? Advanced or Extended Examples?

Validations

Describe internal methodology for validating physics

- Model-specific (“thin target”) validations
- Full-physics thin-target
- Calorimetry (“thick target”)
- Contrast EM-only vs. hadronic vs. inclusive?
- Treat medical physics separately?

Use conference papers for citation here

Use, and solicit, comparison papers from outside experiments

Reference outside papers which show GEANT4 disagreements, e.g., vs. FLUKA or vs. data?