

Physics Lists

J. Apostolakis

Overview

- Status of physics lists
- Improvement of Physics Lists
- Evolution of Physics Lists: new or revise?
- How to validate test Physics Lists ?
- Documentation
- Differences between physics performance
- New application areas and requirements

Status of physics lists

- HEP Production
- Physics List by Application Area
 - advanced examples
- External physics models – and lists ?
 - JQMD, DPMJET, ..

Improvement of Physics Lists

- Mixing models
 - Criteria for transitions between models
 - Brainstorming
 - Critical filtering
- Unified physics modeling
 - New CHIPS physics list
 - Presentation: M Kosov

Criteria for transitions between models

- Brainstorming – collecting suggestions
 - Your proposal / idea here

Revise or create new Physics Lists?

- Development of new Physics lists (PLs) vs revising existing PLs
- Production physics lists - conservative evolution
- Experimental/development PLs
 - Uses and Proliferation
- Addressing confusion
 - Identifying experimental physics lists (vs production PLs)

Experimental/development PLs

- Needs
 - Created novel versions
 - Different combinations (eg QGSP_FTFP_BERT)
 - Revised thresholds (e.g. FTFP_BERT_TRV)
 - Bertini to FTF/Preco between 6 and 8 GeV
 - Try as candidates for addressing issues
- Benefits
- Challenges and Impact
 - Proliferation: many new physics lists
- Actions?

How to validate / test?

- How to test new Physics Lists
- Existing tests
 - simplified calorimeters
- Identifying a comprehensive suite of validation tests to be run
 - To address key use cases (by application area)
- Improving validation and creating

Documentation

- Status of documentation
 - Efforts since Kobe
- Separation
 - Use cases
 - Requirements, validation
 - Physics list ‘engines’
 - Strengths, weaknesses, ..
- How to improve documentation ?
 - Next steps

Differences between PLs

- Understanding & explaining the differences between PL we provide ?
 - Underground (starting point?)
 - Hadron-therapy / medical ?
 - ILC physics list
 - people did not understand it (BERTini up to 13 GeV?)