HepPDT Developments

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HepPDT 2.04.01

- released 5/23/2007
- simple particle data table: particle.tbl
- PDG 2006 numbering scheme
  - official heavy ion numbering scheme
  - +/- 10LZZZAAAI
- doxygen documentation
- sort ParticleDataTable by abs(id)
- expect another quick release based on comments

particle.tbl

- generated from CMS particle table
  - basically pythia table
  - with a few heavy ions
- separate entries for particles and anti-particles
  - occasional need for different information
- comments are either // or # in 1st column
  - not allowed within line
- read with addParticleTable()

particle names

- use HepPID “standard” names in particle.tbl
- really need PDG standard for names just like ID numbers
- some names contain blanks
  - L susy c
  - complicate parsing

particle.tbl info

- name - fixed width - 20 characters
- 2006 PDG ID
- charge
- color (0, 1, or 2)
- mass
- total width
- width cut
- lifetime (have either total width or lifetime)
- decay (1 or 0)

Discussion

- what belongs in a particle table?

HepMC Issues

- a number of proposed changes and requests for HepMC 2
- a few simple fixes for HepMC 1.28
  - nothing that changes interface allowed
  - 1.28.02 by end of week

HepMC 2 changes

- in cvs
- new GenEvent explicit constructor that takes const HeavyIon & and const PdfInfo &
- both const and non-const heavy_ion() and pdf_info() - return pointers
- set_heavy_ion(const HeavyIon &)
- set_pdf_info(const PdfInfo &)
- GenEvent keeps a copy of HeavyIon and PdfInfo
  - ONLY if they exist

HepMC 2 requests

- GenEvent clear() method
- consistent particle ordering
  - for debugging simulations
- something coming from CMS
  - don't know what

particle ordering problem

- particle containers are std::set<GenParticle*>
  - sorted by pointer value
  - extremely non-reproducible
- no information lost, just don't know what order it will use to display particles

possible ordering solution

- would prefer to keep std::set
- add comparator
  - use barcode - guaranteed to be unique
- only momentum and pdg_id are guaranteed when particle created
- barcode is added by iterating over particles in set
  - oops...
- neither momentum nor pdg_id are unique
- serious changes coming to HepMC 2