RunMC status

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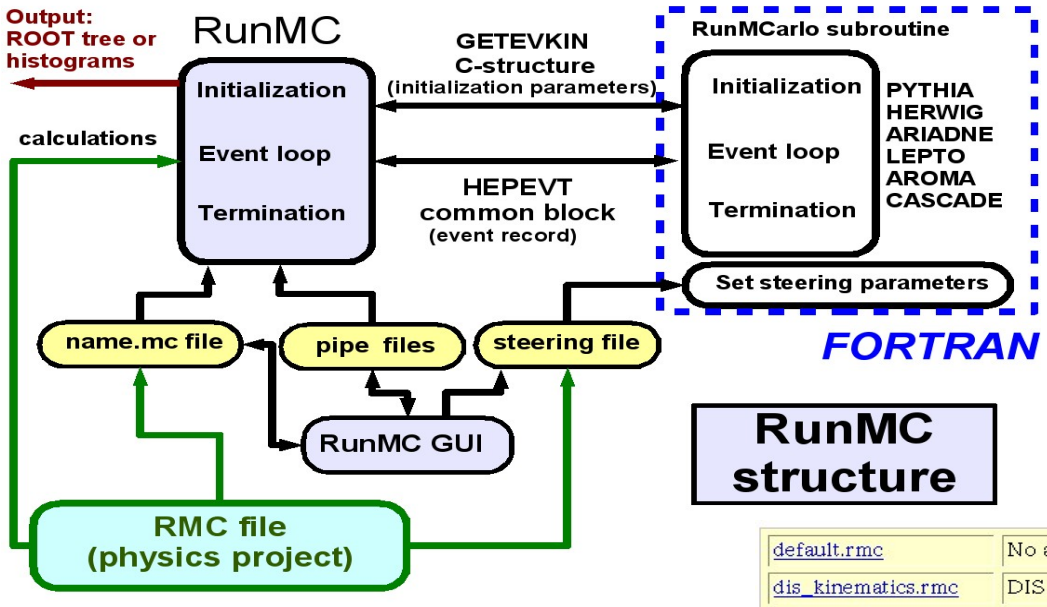
Introduction

- C++ analysis framework for running most popular Monte Carlo (MC) model:
  - ✓ PYTHIA, HERWIG, ARIADNE, CASCADE, LEPTO, AROMA, RAPGAP
- Can be used for MC validations, tuning, comparisons, calculations of correction factors etc.
- Unified input/output
- Use modern C++ libraries:
  - ✓ CLHEP
  - ✓ KT algorithms, event-shape calculations etc.
- Fully integrated with the C++ analysis environment (ROOT)
- Graphical user interface (GUI)

Introduction to RunMC 2.1, June 2, 2004, HERA-LHC workshop
RunMC web page:
http://www.desy.de/~chekanov/runmc
(download, manual, presentations, example calculations etc.)

RunMC structure



RMC files (RunMC www page)

default.rmc	No any MC settings and physics calculations. Only dummy functions
dis_kinematics.rmc	DIS kinematic variables for HERA (Q2,x, etc), SC
charm_dis.rmc	Studies of D* cross sections in DIS (HERA), SC
dis_strange.rmc	Strangeness production (cross sections for K0s, Lambdas etc), SC
baryons_DIS.rmc	Look at kinematics of baryons in DIS at HERA, SC
jets_HERA.rmc	Jets at HERA using longitudinally-invariant KT algorithm (Breit frame), SC
jets_LHC.rmc	Kt jets at LHC with charm, SC
jets+charm_LHC.rmc	Kt jets at LHC with charm, SC
event_shapes.rmc	Event shape studies, SC
par-had-jetLHC.rmc	Jet parton-to-hadron corrections, SC
sbumps.rmc	Search and identification of resonances, SC
hztool.rmc	HZTOOL calculations (v2.0), SC
hztoolv3.rmc	HZTOOL calculations (v3.0), SC
view3d.rmc	Look at 3D pictures of ttbar production at NLC (Geant imitation), SC
view3DjetsHERA.rmc	Look at 3D pictures of Kt jets at HERA (Geant imitation), SC
view3DjetsLHC.rmc	Look at 3D pictures of Kt jets at LHC (Geant imitation), SC

Progress since May 2004

- New MC models were added (now 8 in total)
  - ✓ CASCADE (June 2004)
  - ✓ PHOJET (Nov. 2004)
  - ✓ RAPGAP (Feb. 2005)
  - ✓ In future: ThePEG.
- Concept of physics modules (June 2004)
  - ✓ ~18 physics modules (RMC) were added
  - ✓ Available on the Web (included to the package)
  - ✓ Contain examples of various calculations (jets, event shapes, heavy flavor physics)
  - ✓ Can easily be loaded to RunMC and automatically compiled
- HzTOOL (v3.0) was included as an external module (Nov 2004)
  - ✓ http://hztool.hep.ucl.ac.uk/ (Maintainers: J. Butterworth, H. Jung and B.Waugh)

Progress since May 2004

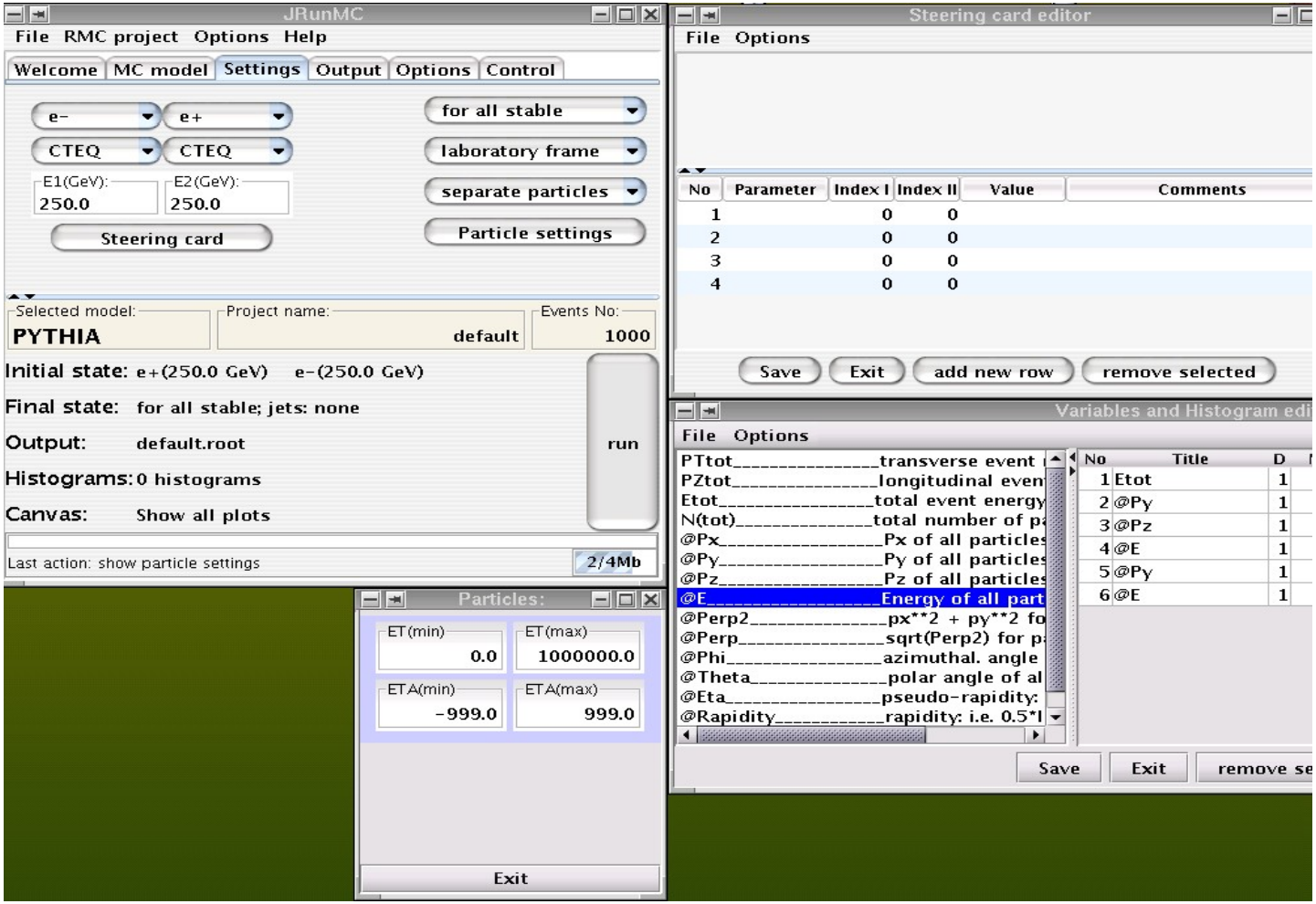
- Histogram Editor
- Steering Card Editor
- ROOT tree analyzer - complete event record can be filled to ROOT tree and later analyzed using RMC modules
  - ✓ ~10 times faster than for usual MC run
- 2D histogram option
- Ported to Windows/Cygwin
- Many bugs fixed
- Paper to CPC / manual / new web page
- Java GUI (in addition to C++ GUI) – Feb 2005

RunMC v2.1 (June 2004) → RunMCv3.3 (Feb 2005)

Java GUI (jrunmc). Advantages

- Small size (~200k)
- Easy to maintain (Java swing)
- Multi-platform
- Third-party programs can easily be included.
  - ✓ Examples: ThePEG, jEdit etc. (see demonstration)
- Many advanced features (syntax highlighting etc.)
- Need for a “plug-in manager”?
  - ✓ Keep all physics projects on the Web
  - ✓ Easy to maintain, update, correct, add etc.

JRunMC



demonstration..