Implementation of Pythia 6 in the JSF framework

- Moving from Pythia 5 to Pythia 6
- JSF Framework
- HEPRUP/HEPEUP
- Interfacing Pythia 6 with Spring
- Comparisons
- Colour Flow

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Moving from Pythia 5 to Pythia 6

Pythia 6 is the latest stable release of Pythia

Better interoperability with other MC

(eg: HERWIG)

Constants are based on more recent results

(eg: latest LEP results)

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JSF Framework

- Pythia is used as an hadronizer after generating the events with another generator.
- The JSF Framework provide standard classes for MC generators (JSFGenerator) .
- A standard hadronizer class (JSFHadronizer) is also available.
- The hadronizer gets the data from the generator through Fortran Commons: HEPRUP/HEPEUP

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HEPRUP & HEPEUP

- To facilitate interoperability between Hadronizers and generator a standard data format has been proposed.
- This standard defines 2 fortran common blocks: HEPRUP for Run User Process information *and* HEPEUP for Events information.
- HEPRUP: beam particles ID, beam energy, Events weighting scheme, subprocesses
- HEPEUP: process ID, Event weight, energy scale, particles history (ID, status, mother, colour flow, momentum, position, spin,...)

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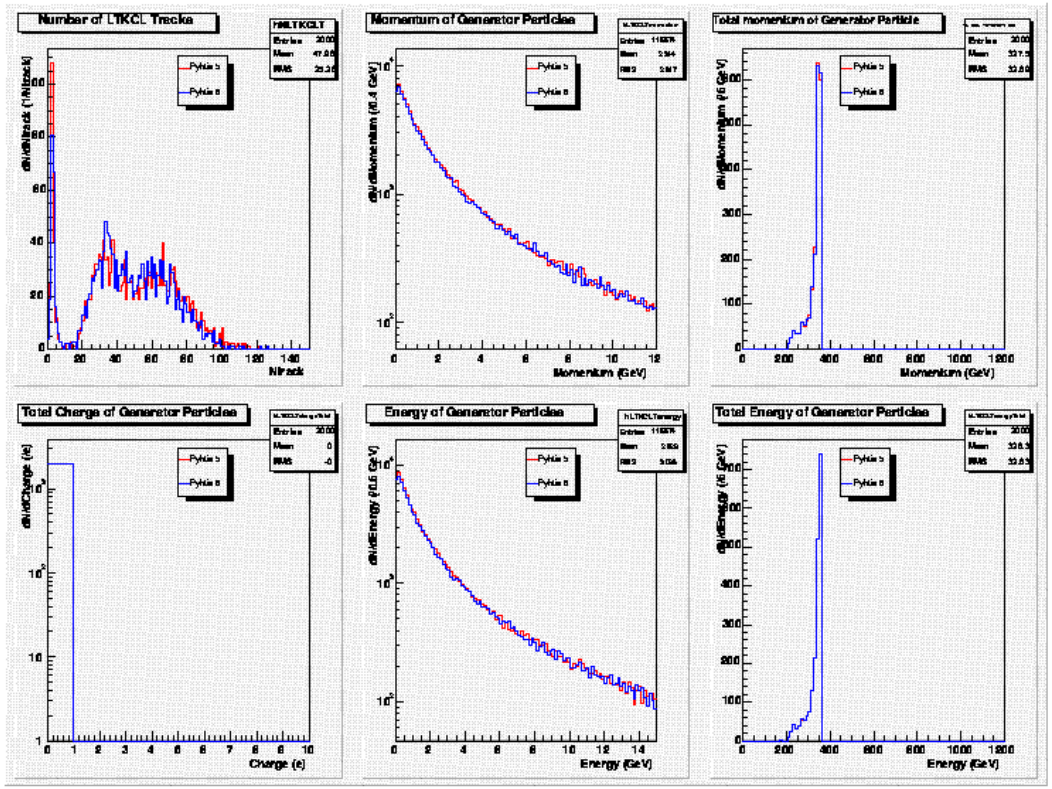
Interfacing Pythia 6 with Spring

- A class converting the Spring Output to HEPRUP/HEPEUP has been written
- Events have been produced with the new scheme and the previous scheme (based on Pythia 5)



Good agreement between pythia 5 and 6

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Colour Flow

The colour flow of the particles is determined by the following rules (gluons are not handled):

- Bosons & leptons (ID between 10 and 50) are colourless
- Coloured daughters of a coloured particle carry the same (or opposite) colour
- Daughters of the same particle carry the same (or opposite) colour
- Colour of coloured daughter of colourless particle are assigned with different values

This algorithm will be tested soon on top events

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Prospects

- Spring/Pyhtia 6 interface is completed
- Colour flow algorithm will be checked soon
- Next step: Implement TAUOLA in the JSF Framework for events with TAU
- Later: new MC Generator for the exotics group

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