A Pythia Interface to Java

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- **Java Framework Design**
- **Pythia-JNI**
- **Examples**
- **Future Improvements**

Java Framework Designs

- **Interface to Event Generators**
  - **Pythia (6.152)**
  - **Pandora (2.1)**
  - **Wizard (?)**
  - **Read existing StdHEP files**
- **Interface to Detector Simulation**
  - **FMC (US Fast Monte Carlo)**
  - **SimDet (European Fast Monte Carlo)**
- **Reconstruction and Analysis**
  - **Java/JAS – hep.lcd**
  - **HBOOK ntupler**

Pythia Java Native Interface (JNI)

What's Pythia-JNI:

Stand-alone package for setting up and running Pythia event generation, detector Fast Monte Carlo (FMC) simulation and user analysis in Java and /or Fortran.

- Software Package needed
  - Pythia, Pandora, CERNLIB, StdHep
  - JAS
- Provides a convenient Java interface to the Pythia Monte Carlo Package.
  - Written in Fortran, C and Java
  - Full interface to Pythia (helps from S. Mrenna)
  - Allow to read in Stdhep files
  - Uses /HEPEvt common for C interface
  - Uses Java Native Interface (JNI) to HEP Java class libraries
    - hep.physics – (defines Particles, PDGID)
    - hep.lcd – (LCD simulation and analysis framework)
  - Uses Fast Monte Carlo Detector simulation

Current Status

- **Pythia-JNI can be down loaded at http://obsidian.lbl.gov/ ronan/docs/Pythia-JNI**
- **Instructions included**
- **Examples tested on Solaris Unix/RedHat 6.2**
  - **Event analysis studies trk/jet resolutions**
  - **Jet analysis studies $e^+e^- \to b\bar{b}$ jet distributions.**
  - **Write out both Jas and Hbook (Ntuple) files**
- **Getting Started:**
  - **Setting up JAS**
  - **Editing and Compiling (JAS, Windows and Unix/Linux)**
  - **Viewing Java Histograms with JAS or PAW**
  - **Scanning Events as Event Display (lcd.jar)**

Pythia Analysis Examples

- **PythiaEventAnalysis – Get tracks and clusters to compare smeared momenta and energies to generated values.**
- **Running Analysis**
  - **Edit & compile the analysis code**
  - **Run the analysis (script)**
  - **Look at output, view Java histograms(PythiaEventAnalysis.javahist)**
- **Plots: (Ntracks, NClusters, e/p, de/dx, ...)**

Future Improvements

- **The Package is in good shape, depends on what you want to do.**
- **Some of hand work still necessary, check with Mike.**
- **Improve User-JNI analysis for HBOOK Ntupler**
- **Add the interface to ROOT (?)**
- **Improve the detector simulation**
- **Adding the vertexing capabilities**
- **Documentations**
- **...**
- **Give a Try and send your feedback**