

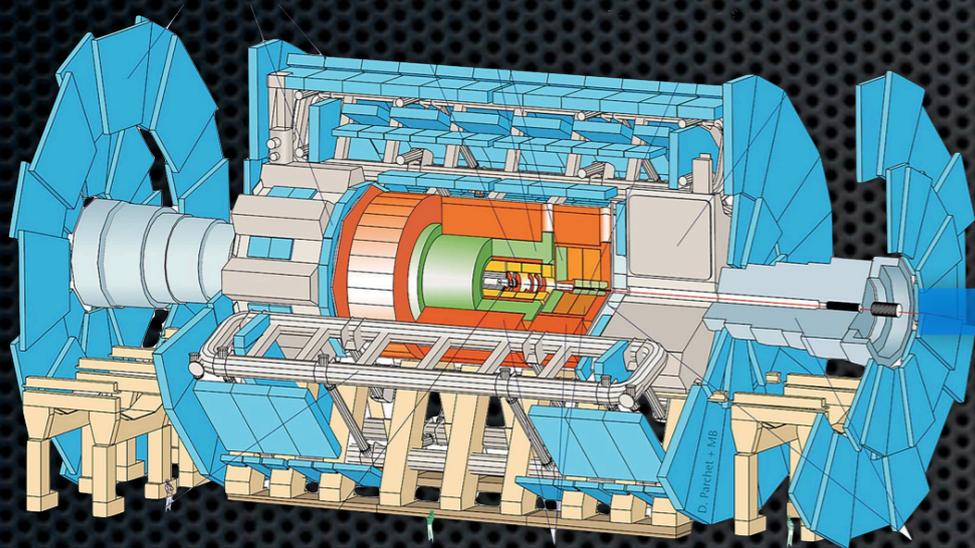
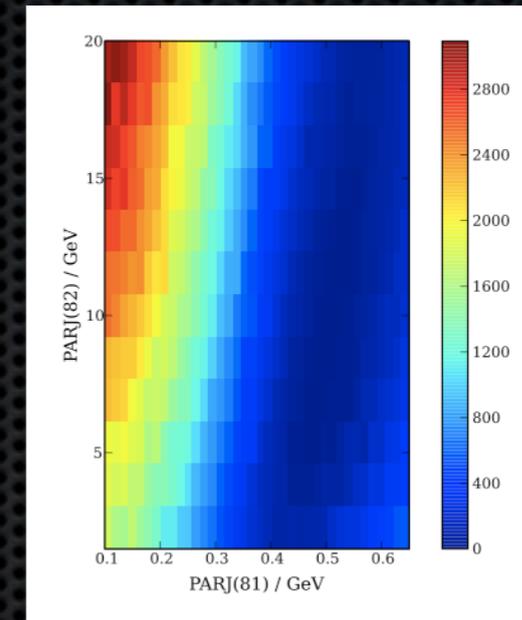
HepData

James Monk on behalf of Cedar

- What does HepData do?
- The old model
- The new HepData
 - HepML
 - Object model
 - Hibernate
- JetWeb - an application that makes use of it
 - Rivet
 - Demo

Make results searchable
by other projects

Monte
Carlo
tuning

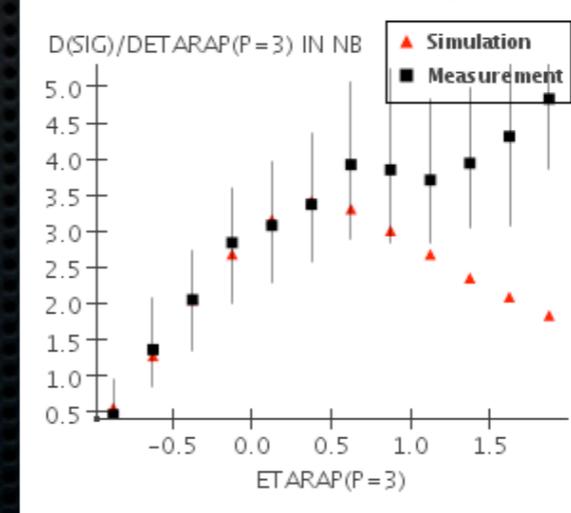


HepData

PDF fitting

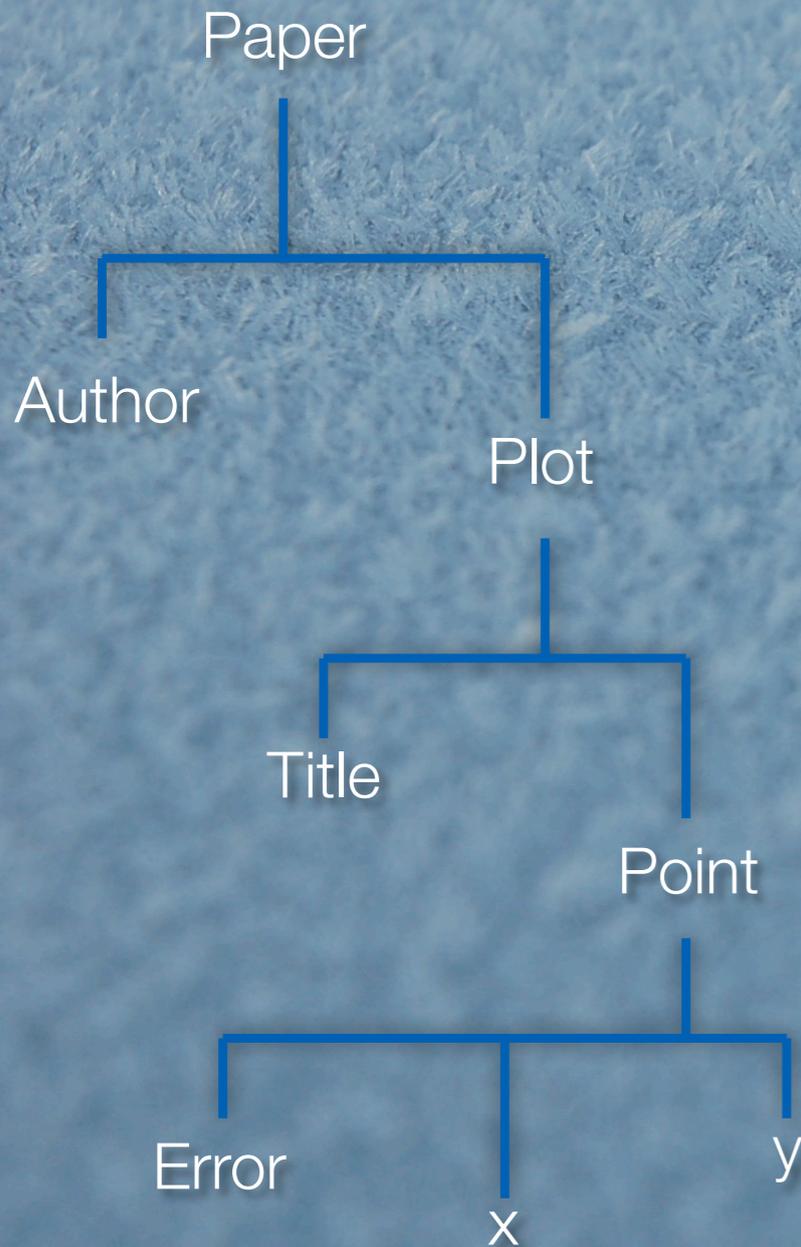
Many measurements
from HERA, LEP, Tevatron
and others since the 1970s.

Second systematic error is uncertainty in the E...



Used by
JetWeb as
comparison
data for Monte
Carlo validation.

Data is mostly hierarchical so fitted well with old-style databases



What about things like reaction type, collision energy. Do they belong to the paper or does the paper belong to them?



Computing technology has changed since the 1970s...

Lacking the following features

- ✦ Remote queries
- ✦ SQL support
- ✦ Java support
- ✦ Trivial to update queries

...not really ideal for a scaleable modern Java app.

Change to MySQL before LHC start-up.
(other SQL capable relational databases would also work)

Flat files

Map the legacy paper onto the new paper

Split into one file per paper to save searching for each entry

Files contain things like

- ✦ Paper id
- ✦ Paper
- ✦ Plot
- ✦ X value
- ✦ Y value
- ✦ Errors
- ✦ Systematic
- ✦ Axis
- ✦ Dataset
- ✦ References
- ✦ Experiment

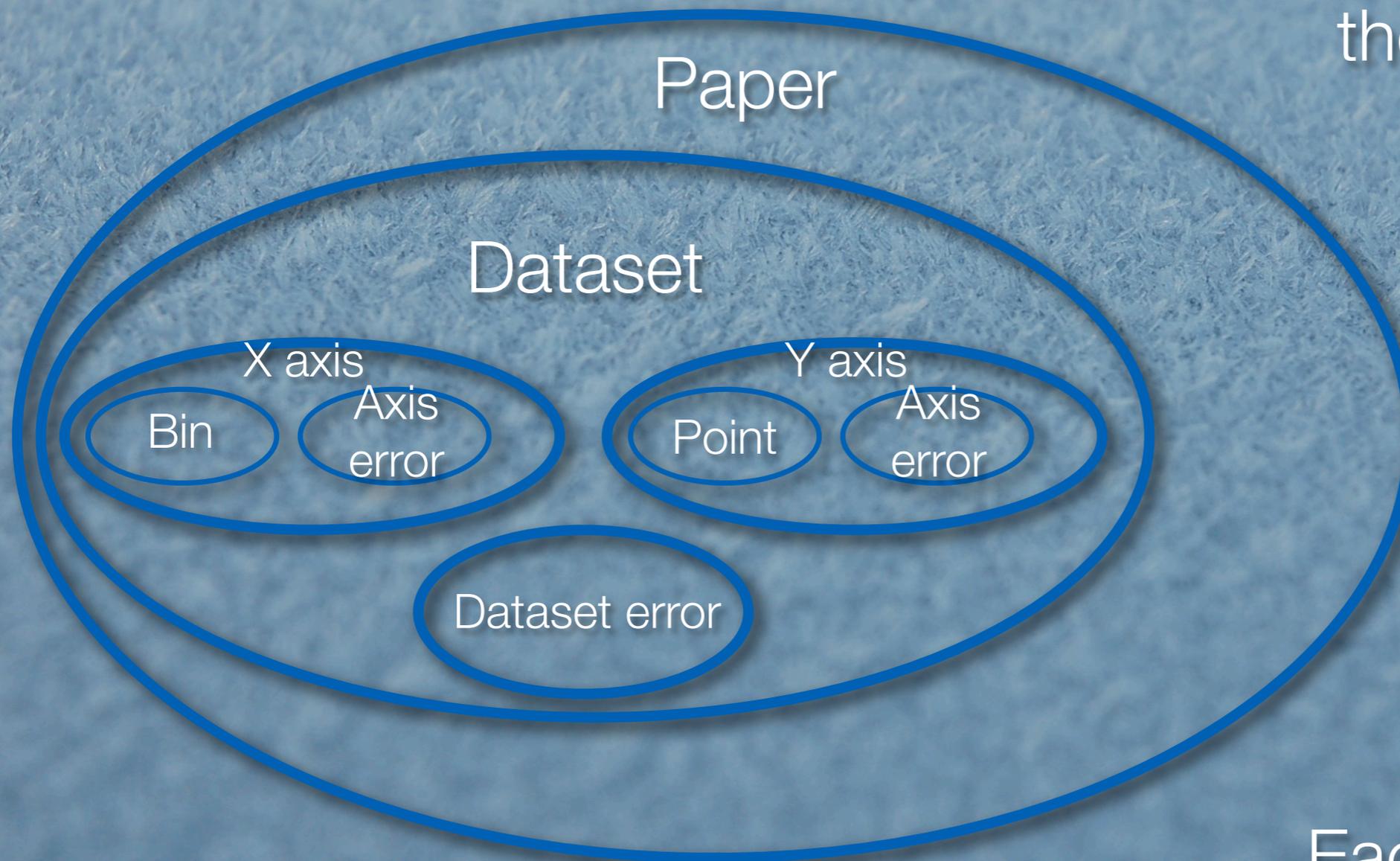
Flat files converted to HepML



Marshalling automated using castor

Java objects similar to the old data structures

Each object can contain several of the objects inside it



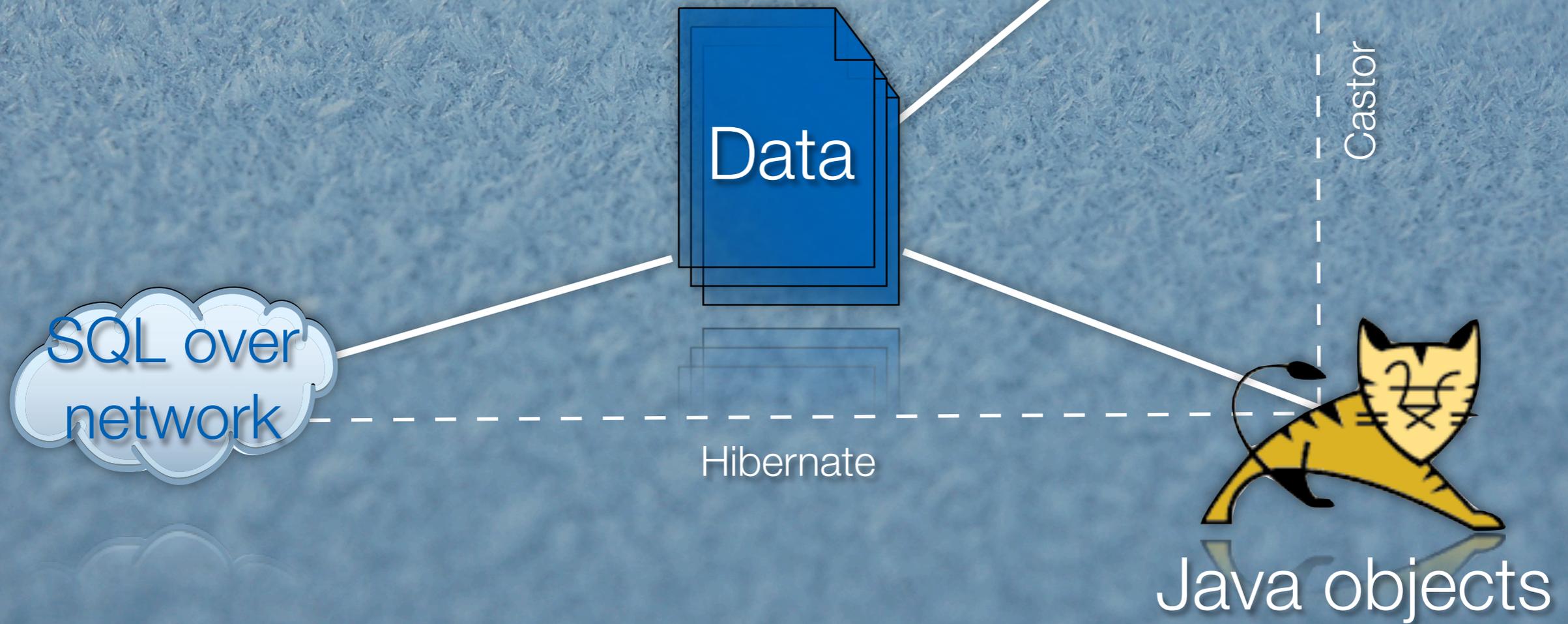
Each combination of X and Y axis within a Dataset corresponds to a plot

Each object contains a reference to its containing object

- ✦ Used to abstract the mapping between Java objects and database entries
- ✦ Automatically fetches all objects contained in the top object as necessary
- ✦ SQL like queries for fetching
- ✦ Transactions
- ✦ Annotations mapping private object data onto tables.

Same data can now
be represented in
many ways

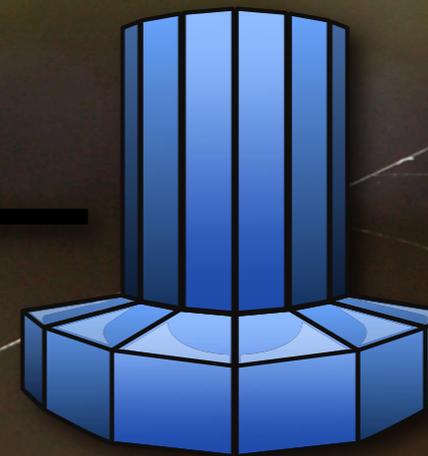
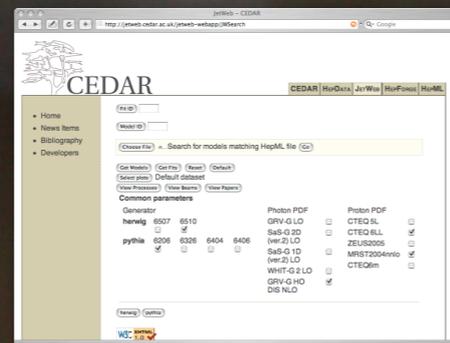
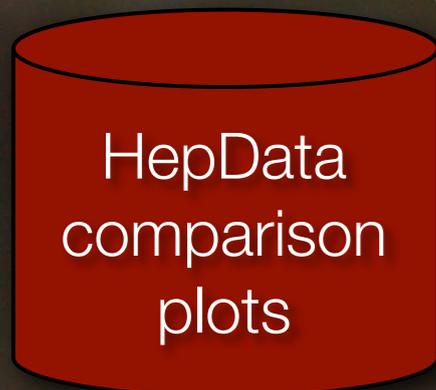
HepML to take
away **XML**



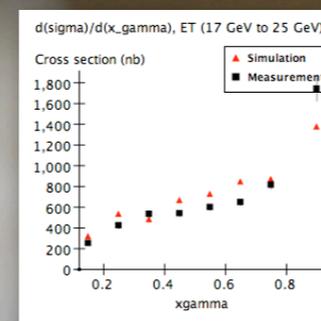
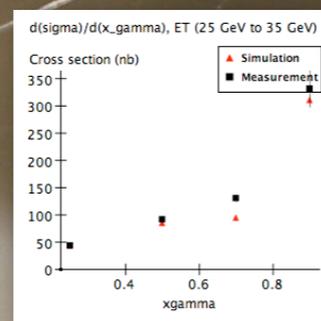
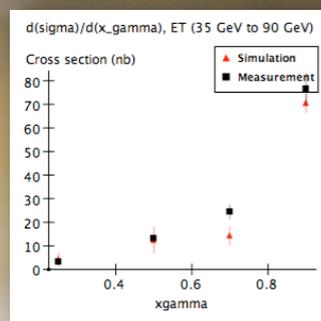
From these can obtain Aida, Root, png, plain text...

- ✦ Keeps record of existing generator tunings, previous jobs and results
- ✦ Searchable by hand or using HepML file to match the tune
- ✦ Steers job submission

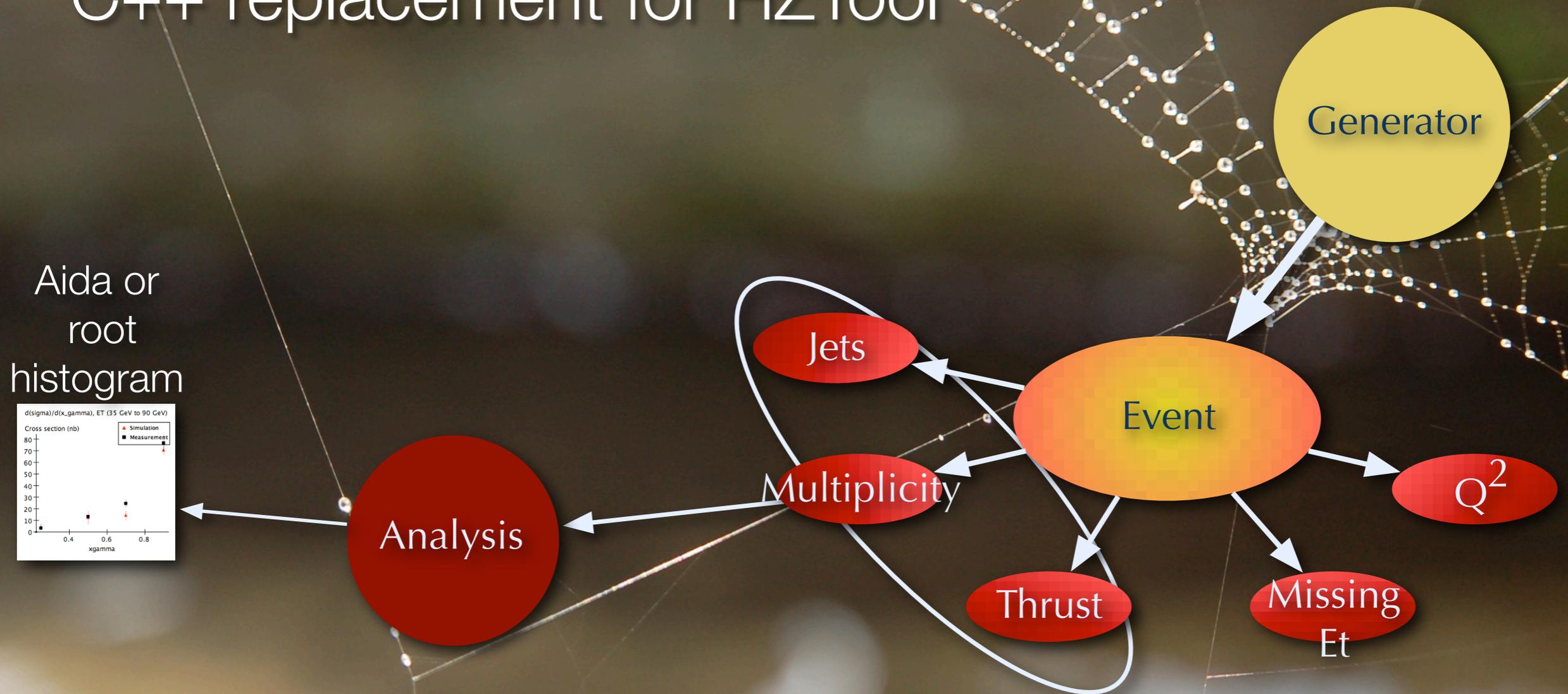
JetWeb web interface and database of models



Monte Carlo comparison plots and χ^2 with data



C++ replacement for HZTool



Each projection evaluated once per event and used in many analyses



CEDAR

[CEDAR](#) |
 [HEPDATA](#) |
 [JETWEB](#) |
 [HEPFORGE](#) |
 [HEPML](#)

- Home
- News Items
- Bibliography
- Developers

Fit ID

Model ID

n... Search for models matching HepML file

Default dataset

Common parameters

Generator

| | | | | |
|---------------|--------------------------|--------------------------|--------------------------|--------------------------|
| herwig | 6507 | 6510 | | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | |
| pythia | 6206 | 6326 | 6404 | 6406 |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Photon PDF

GRV-G LO
 SaS-G 2D (ver.2) LO
 SaS-G 1D (ver.2)

Proton PDF

CTEQ 5L
 CTEQ 6LL
 ZEUS2005
 MRST2004nnlo
 CTEQ6m

- HepData provides data to other projects
- Migration to SQL
- HepML as a transportable representation of the data
- Hibernate to abstract the SQL interface
- Java object model accessible from a web servlet
- JetWeb as an example of the service that HepData can now provide