

Common data base and model interface (for FAIR and GSI energies)

open discussion

Goals:

Easy and fast comparison between:

- Different Experiments
- Theory and Experiment
- Benchmark for Models

Data base

Interface

Model Hub

hepdata.net as common data base

HEPData
Repository for publication-related High-Energy Physics data

This new site replaces the old site at <http://hepdata.cedar.ac.uk>.

Search on 8792 publications and 78823 data tables.

Search for a paper, author, experiment, reaction [Advanced](#)

e.g. reaction $PP \rightarrow LQ LQ X$, title has "photon collisions", collaboration is LHCf or D0.

Data from the LHC

ALICE

CMS

LHCb

Data base

- Frequently used by LHC experiments
- Existing since more than 30 years
- Not many data points from FAIR and GSI energies included yet

hepdata.net as common data base

The screenshot shows the HEPData website interface. At the top, there is a search bar and navigation links. The main content area displays a table titled "Table 1" with the following data:

RE	PB PB --> JPSI < MU+ MU- > X
SQRT(S)	5020.0 GEV
YRAP	2.50 TO 4.00
CENTRALITY	0.0 TO 10.0 pct
PT (GEV/C)	v_2
1.18 (bin: 0.0 - 2.0)	0.021 ±0.0122 stat ±0.0011 sys
2.79 (bin: 2.0 - 4.0)	0.0313 ±0.0128 stat ±0.001 sys
4.8 (bin: 4.0 - 6.0)	0.0278 ±0.0189 stat ±0.0012 sys
6.76 (bin: 6.0 - 8.0)	0.0096 ±0.0324 stat ±0.0014 sys
9.39 (bin: 8.0 - 12.0)	0.0183 ±0.0407 stat ±0.0024 sys

Below the table, there is a plot titled "Visualize" showing the v_2 coefficient as a function of p_T in 0-10% centrality interval in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The plot shows data points with error bars for different p_T bins.

- What should be stored?
- Figures included in the paper
- Corrected data as function of p_T, y in addition?

hepdata.net as common data base

[Home Page](#)
[Other Data Reviews](#)
[Reaction Database](#)

CONTENTS

Experiments

CERN-SPS
[NA3](#) [NA10](#)
[NA11](#) [NA16](#)
[NA27](#) [NA32](#)
[NA34-3\(HELIOS\)](#)
[NA38](#) [NA50](#)
[NA51](#) [NA60](#)

CERN-SppS
[UA1](#) [UA6](#)

DESY-HERA
[HERA-B](#)

BNL-RHIC
[PHENIX](#) [STAR](#)

Fermilab-Tevatron
[CDF](#) [D0](#)
[E772](#) [E789](#)
[E866](#)

CERN-LHC
[ALICE](#) [ATLAS](#)
[CMS](#) [LHCb](#)

Initial States

[p\(bar\)-p](#)
[p-d](#) [p-A](#)
[d-A](#) [A-A](#)
[meson-p\(A\)](#)

Measurements

Cross Sections
[Total](#)
[Differential\(Y\)](#)
[Differential\(PT\)](#)
[Differential\(X\)](#)
[Polarization](#)

HEPDATA ON-LINE DATA REVIEW

A Review of Quarkonii Data in Hadronic Interactions

HEPDATA ON-LINE DATA REVIEW

An up-to-date archive of Quarkonii data in Hadronic Interactions

data from a specific experiment

CERN-SPS		CERN-SppS	HERA	BNL-RHIC	Fermilab-Tevatron	CERN-LHC
NA3	NA10	UA1	HERA-B	PHENIX	CDF	ALICE
NA11	NA16	UA6		STAR	D0	ATLAS
NA27	NA32				E772	CMS
NA34-3	NA38				E789	LHCb
NA50	NA51				E866	
NA60						

data for a specific initial state

(anti)proton-proton	proton-deuteron	proton-nucleus
deuteron-nucleus	nucleus-nucleus	meson-proton(nucleus)

data for a specific measurement

Cross Sections	Final States
Total	J/PSI PSI
Differential-PT	CHI/C XI/C
Differential-Rapidity	Lambda/C
Differential-X	Upsilon
Polarization	D/D* DiMuon
	Charm Beauty

To send any comments on this service please use [feedback](#)

- Umbrella data base e.g. on Quarkonii Data

OSCAR (Open Standard Codes and Routines)



The screenshot shows the OSCAR website interface. At the top, the logo "OSCAR" is followed by the tagline "Open Standard Codes and Routines". Navigation tabs include "page", "discussion", and "view source". A sidebar on the left contains a menu with items like "About", "News", "Codes", "OSCAR formats", "Repository", and "Old OSCAR site", along with a search box. The main content area lists codes under seven categories:

- 1. Partonic/string transport**
AMPT , HIJING , HIJING/B-anti-B , MPC , neXus , PCPC , PSM , VNI , VNib , ZPC
- 2. String/hadronic transport**
AMPT , ART , BEM , BNC , HSD , JAM , JPCIAE , LEXUS , LUCIAE , RQMD , UrQMD
- 3. Hydrodynamics and freezeout**
AZHYDRO , BJ_HYDRO , UVH2+1
CORNELIUS , THERMINATOR
- 4. Classical Yang-Mills**
CGC
- 5. Initial conditions**
GLISSANDO
- 6. Transport and hydro tools**
GCP , PAREVO
- 7. Correlation builders**
CRAB

- Needs constant maintenance

Model Hub

RIVET (Robust Independent Validation of Experiment and Theory)

- Rivet home
 - Professor
 - YODA
 - Contur
 - MCplots
 - AGiLe
- Downloads
 - New analyses
- Analyses
 - Standard analyses
 - Analysis changelog
 - Writing an analysis
 - Submitting analyses
- Analysis coverage & wishlists
 - General
 - No searches/HL
 - Searches
 - Heavy ion
 - Submitting analyses
- Documentation
 - Getting started
 - Rivet via Docker
 - Manuals & tutorials
 - Troubleshooting / FAQ
 - Changelog
 - Writing an analysis
 - Submitting analyses
 - Writing an analysis (doxygen)

Interface

Rivet

The Rivet toolkit (Robust Independent Validation of Experiment and Theory) is a system for validation of Monte Carlo event generators. It provides a large (and ever growing) **set of experimental analyses** useful for MC generator development, validation, and tuning, as well as a convenient infrastructure for adding your own analyses.

Rivet is the most widespread way by which analysis code from the LHC and other high-energy collider experiments is preserved for comparison to and development of future theory models. It is used by phenomenologists, MC generator developers, and experimentalists on the LHC and other facilities.

Features

- Object-oriented C++ framework for analysis algorithms
- Ever-increasing collection of analyses, more than 400 so far...
- Python interface and suite of user-friendly data handling scripts
- Large collection of generator-independent event analysis tools
- Automatic caching of expensive calculations, for efficiently running many analyses on each event
- Flexible system for fast detector effect simulation in BSM analyses
- Close matching of standard observables to experimental analysis definitions
- Reference data connection to **HepData**, avoid hard-coding

The Rivet user manual is kept up to date **on the arXiv (1003.0694 [hep-ph])**.

The C++ MC generators Herwig and Sherpa have convenient user interfaces for producing input events for Rivet analysis, as well as built-in Rivet support. Users may find the **Sacrifice** interface convenient for running Pythia 8, and the **AGiLe** steering interface useful for older Fortran generators like PYTHIA6 and HERWIG6.

Input format for models: hep mc format

WANTED: Analysis code

We need your analyses! Preserving analysis logic in a re-runnable, re-interpretable form is a key part of scientific reproducibility and impact at the LHC and other HEP experiments. If you are member of an experimental collaboration, please have a look at **our wishlist** and help us by providing us with Rivet analyses for your publications. This will also ensure that your measurements get used (and cited)!

MCnet studentships!

Would you like to work on a short project involving Monte Carlo event generators?

MCnet offers 3-6 month fully funded studentships for current PhD students.

See montecarlonet.org for more information!

Docker container for Rivet

Benchmark for models, example: Analysis Suite SMASH

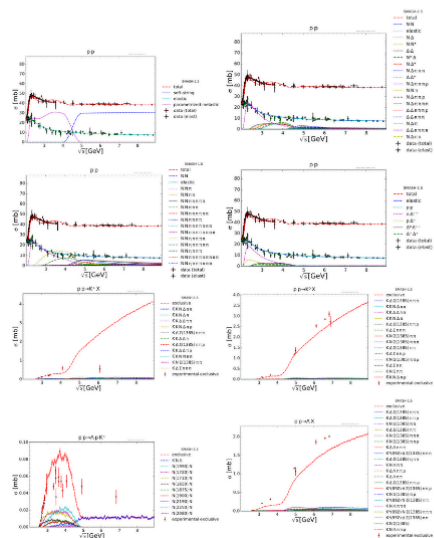
Analysis Suite for SMASH-1.5

Cross Sections

Collection of cross sections for different elementary scattering processes. Inclusive and exclusive cross sections are presented.

p + p

Comments: Double pion production is tricky and needs to be investigated (#5370).



- Python script machinery will be publicly available soon
- impossible to keep up within single groups, therefore create synergies
- join community effort (Rivet-HI) instead of island solution?