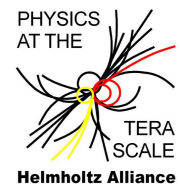
The MCPLOTS Project

April 20, 2011



The MCPLOTS Project

- **MCPLOTS Project:**
  - `http://mcplots.cern.ch/`
  - combined project of CERN Theory Group, MCnet, GenSer and LPCC,
  - **repository of MC plots comparing MC generators predictions to experimental data**,
  - data-comparisons part: based on Rivet,
  - intended for tuning and reference purpose.

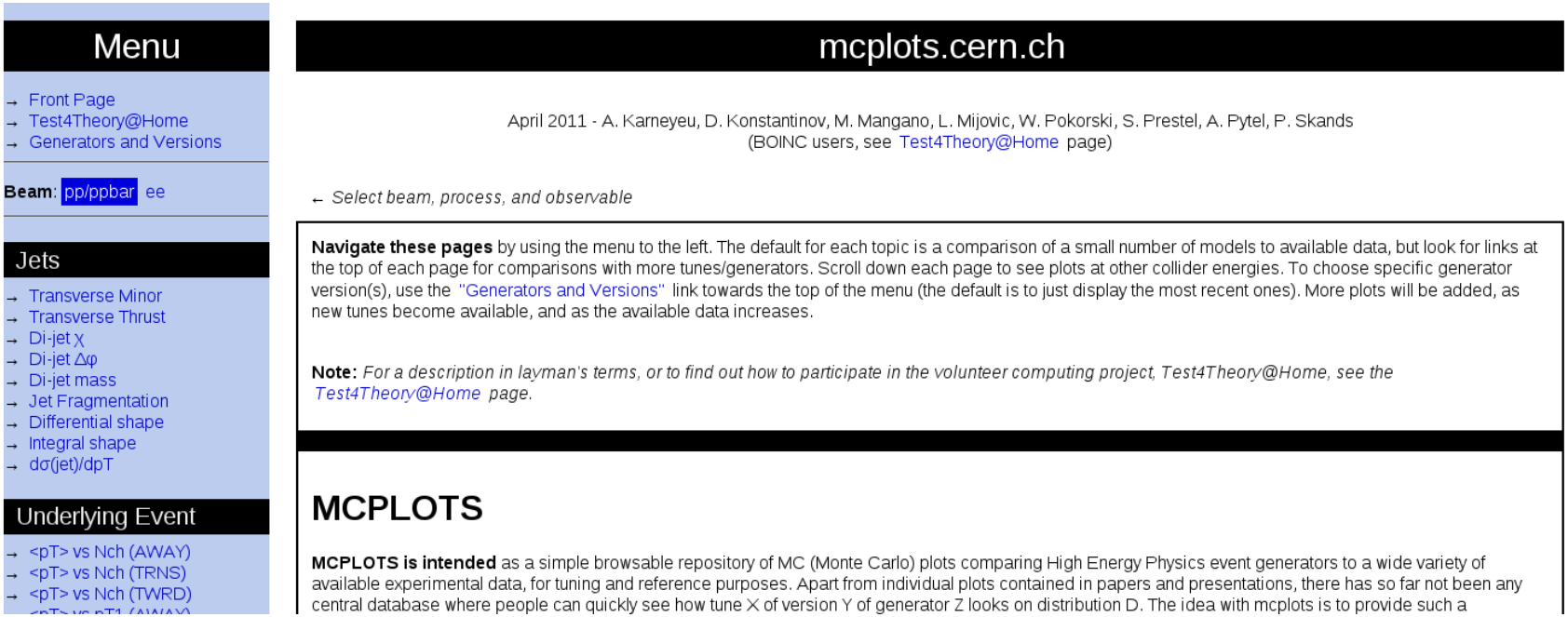
- **Contribution by DESY:**
  - `http://mcplots-dev.cern.ch/`,
  - implementation of the Alpgen generator in the framework.

- **Outline:**
  - brief introduction of **MCPLOTS**,
  - more details on the **Alpgen implementation**.

  - **Status:**
  - Alpgen running in MCPLOTS,
  - but problems with adding Rivet histograms not yet fully resolved.

The MCPLOTS Project - 1

http://mcplots-dev.cern.ch/



- **Available Plots:**
  - pp/ppbar, ee beams,
  - Jets, UE, MinBias, DY, W+Jets,
  - a large number of Rivet analyzes (ATLAS,CMS),
  - a set of generators and a large set of tunes.

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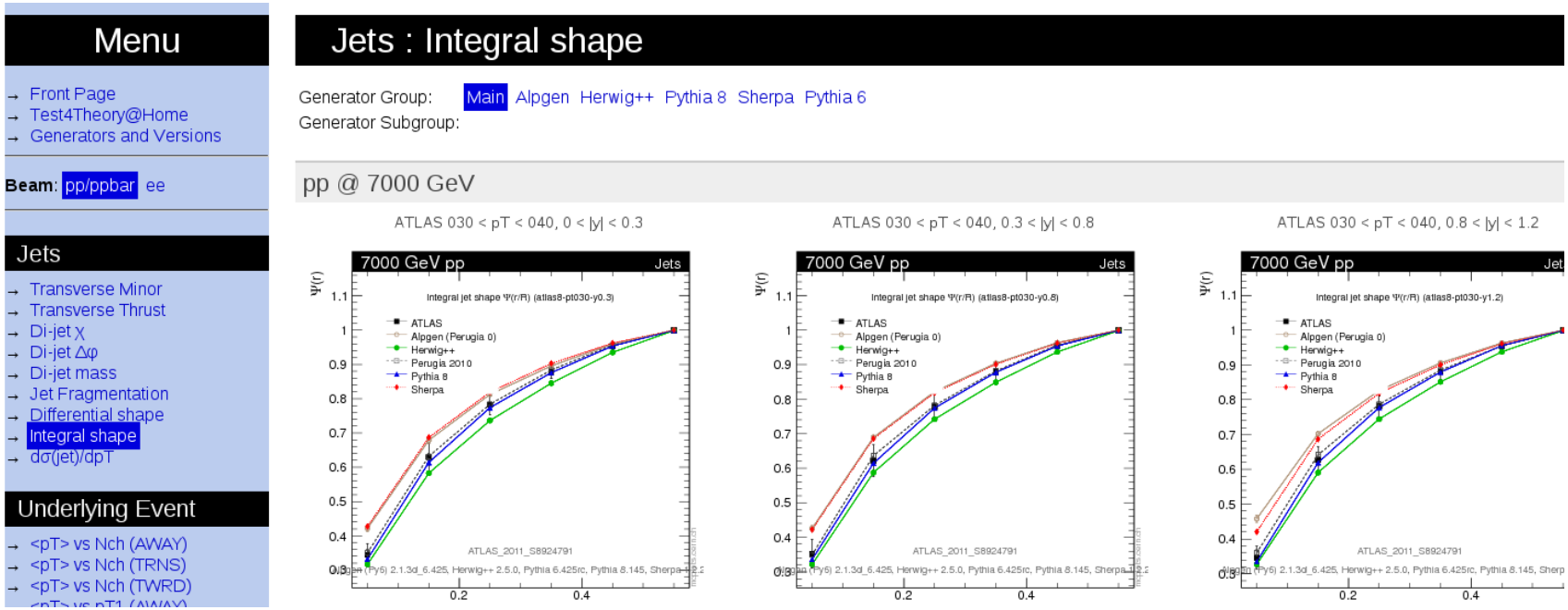
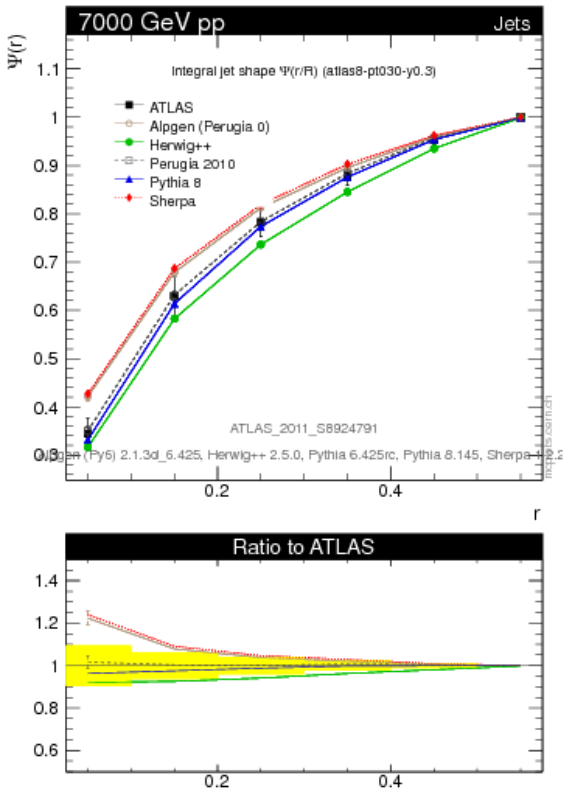


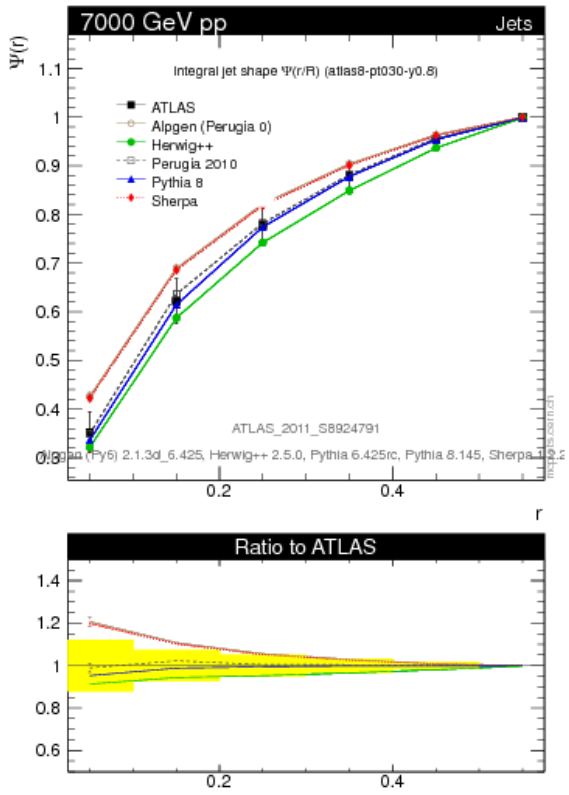
- **Available Generators:**
  - Pythia 6, 8
  - Herwig++,
  - Sherpa,
  - Alpgen (dev).

The MCPLOTS Project - 3

http://mcplots-dev.cern.ch/



[pdf] [eps] [png] less← [steer] [ATLAS reference] [Alpgen (Perugia 0) param] [Herwig++ param] [Perugia 2010 param] [Pythia 8 param] [Sherpa param]



[pdf] [eps] [png] less← [steer] [ATLAS reference] [Alpgen (Perugia 0) param] [Herwig++ param] [Perugia 2010 param] [Pythia 8 param] [Sherpa param]

- Detailed setup available for each generator.

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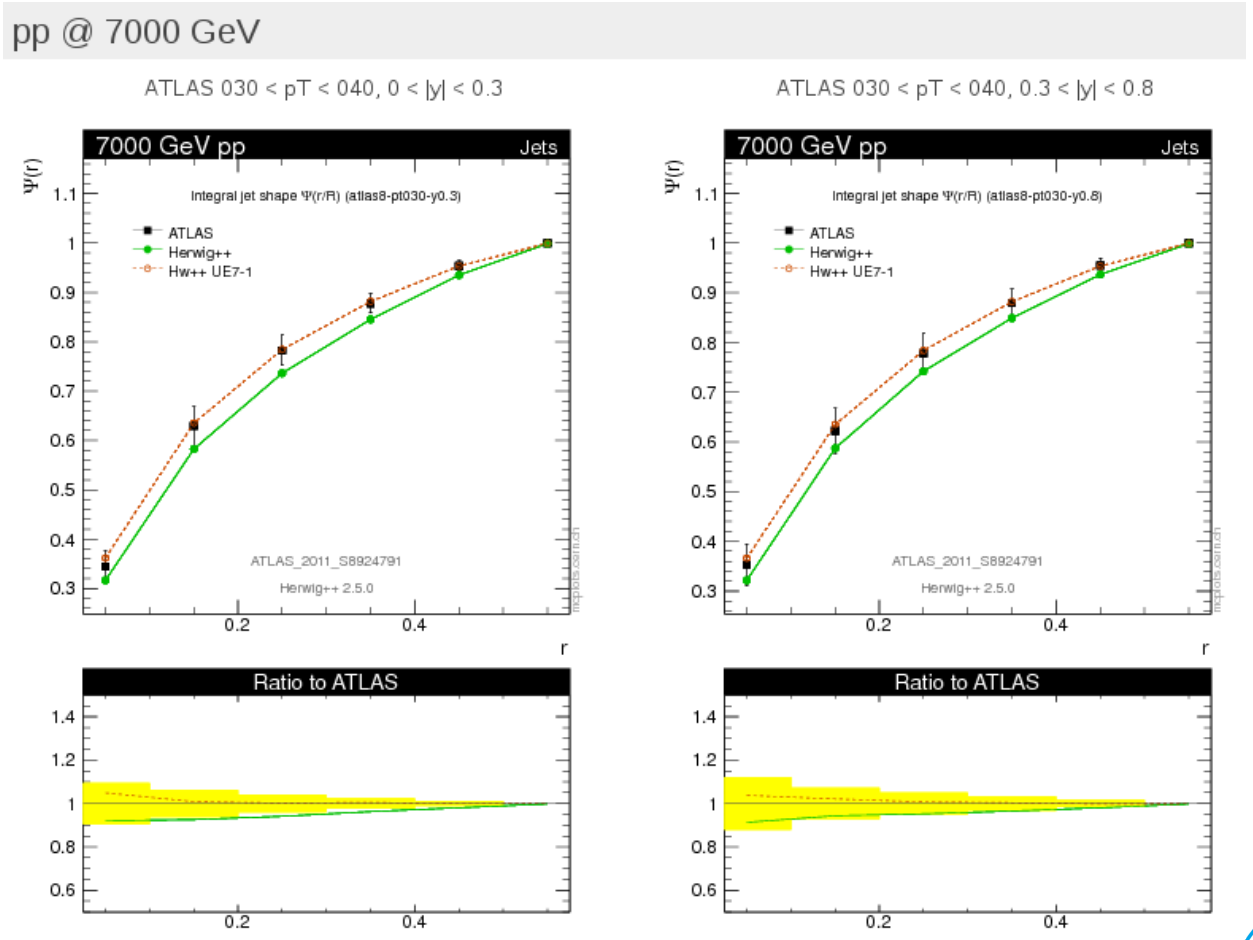

- Plots available for different tunes.

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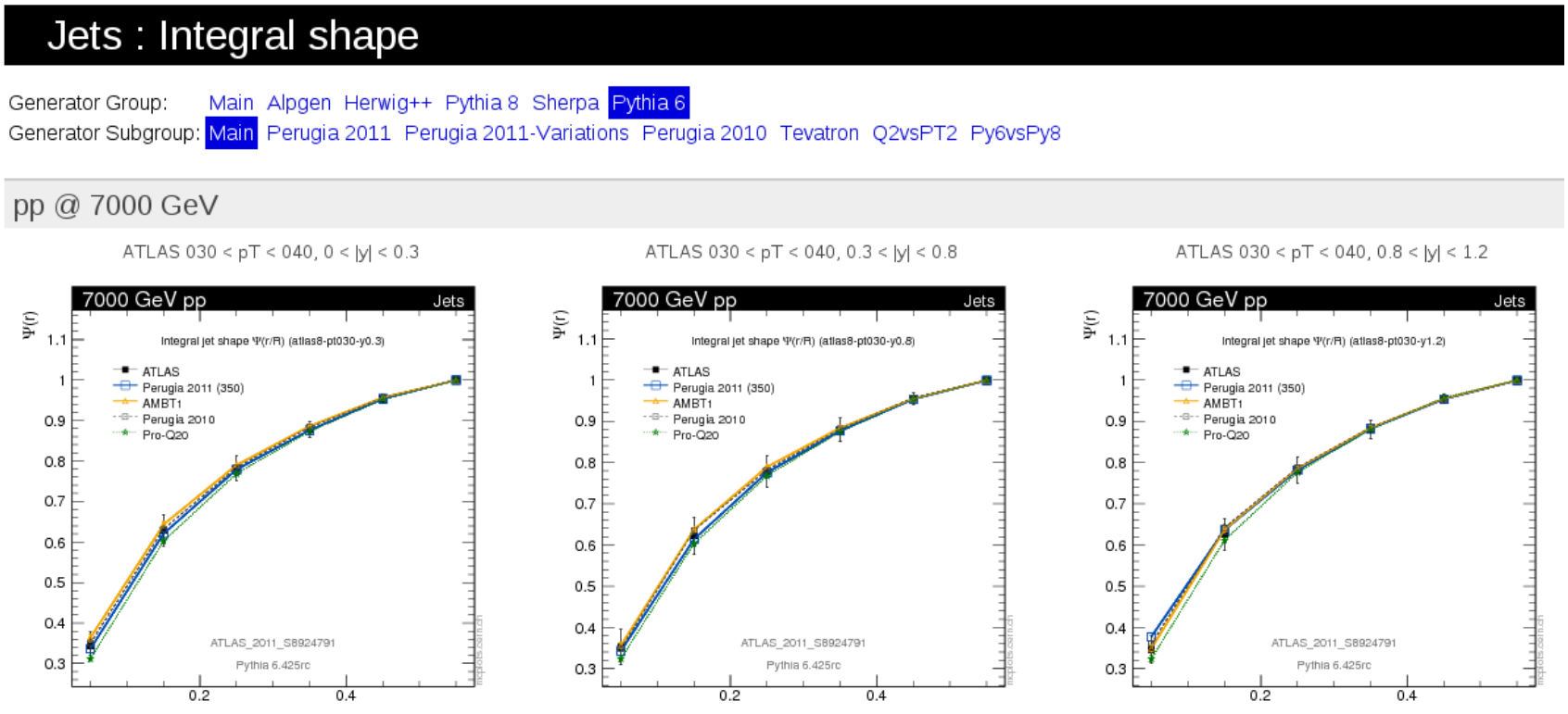
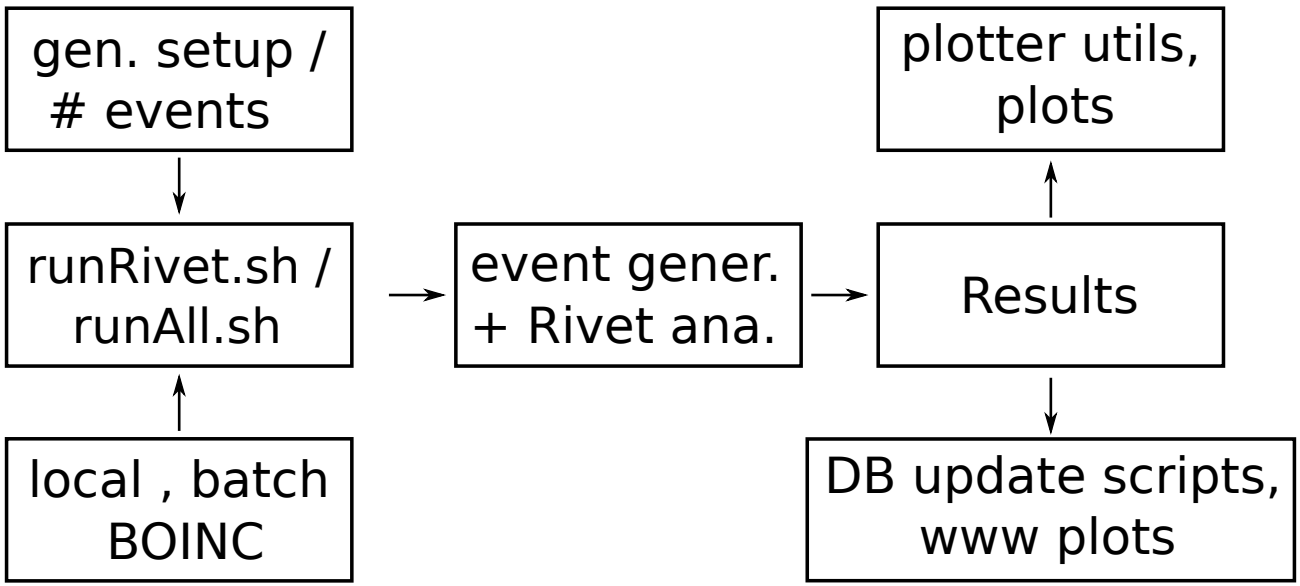


- Plots available for many different tunes.

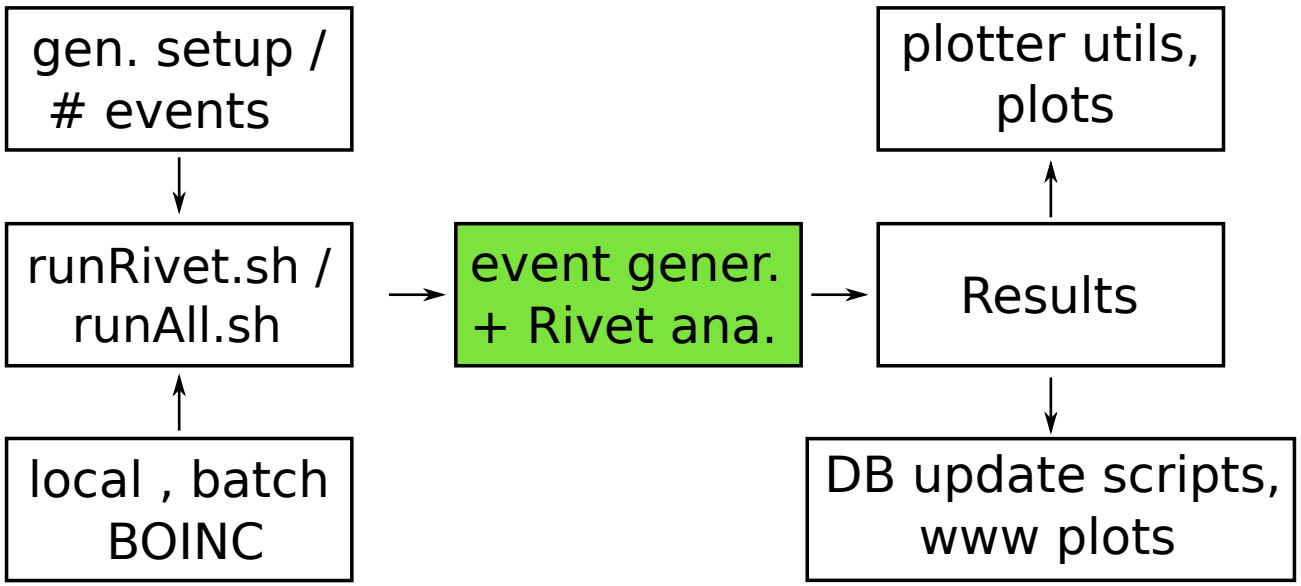
The MCPLOTS Project - 6

- MCPLOTS contains pre-determined set of generator parameters and setups,
- it also contains scripts that control submission, event generation, analysis and final results manipulation.
- A script for a (batch) run of all the setups, intended for the documentation at the MCPLOTS pages is provided.



Alpgen Implementation - 1

- Event generation: need to take care of generating Alpgen weighted / unweighted events,
- using genser installation,
- supported for all Alpgen processes, Pythia, Herwig(Jimmy) + arbitrary param. set,
- special utils like Alpgen event-level filters provided (high-pt jets ...).



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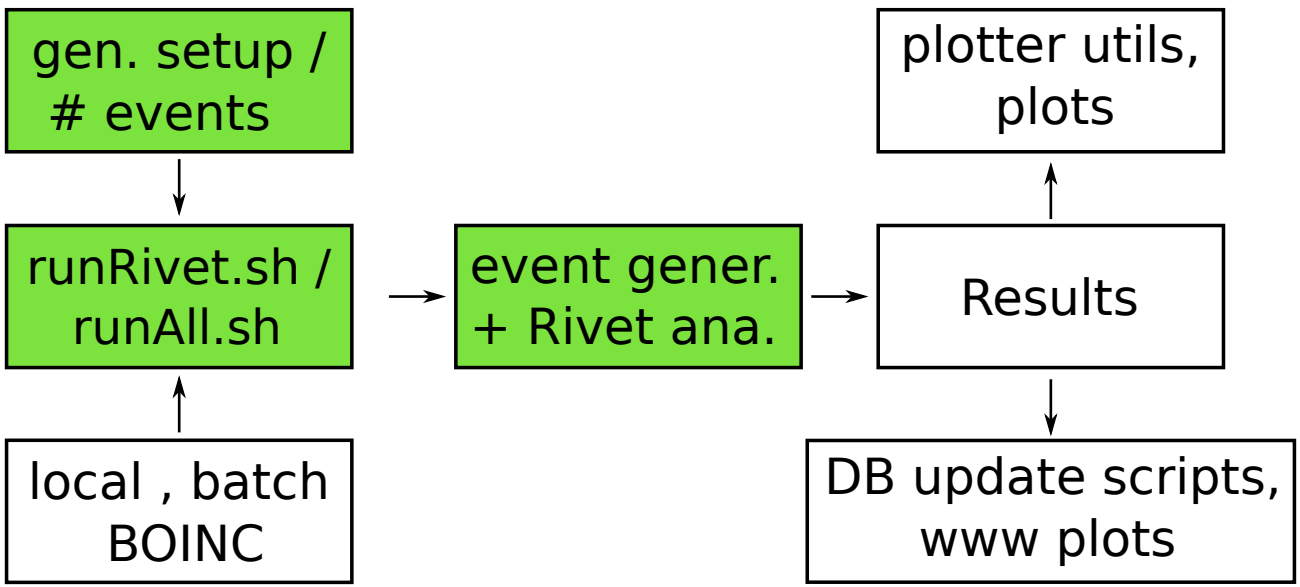
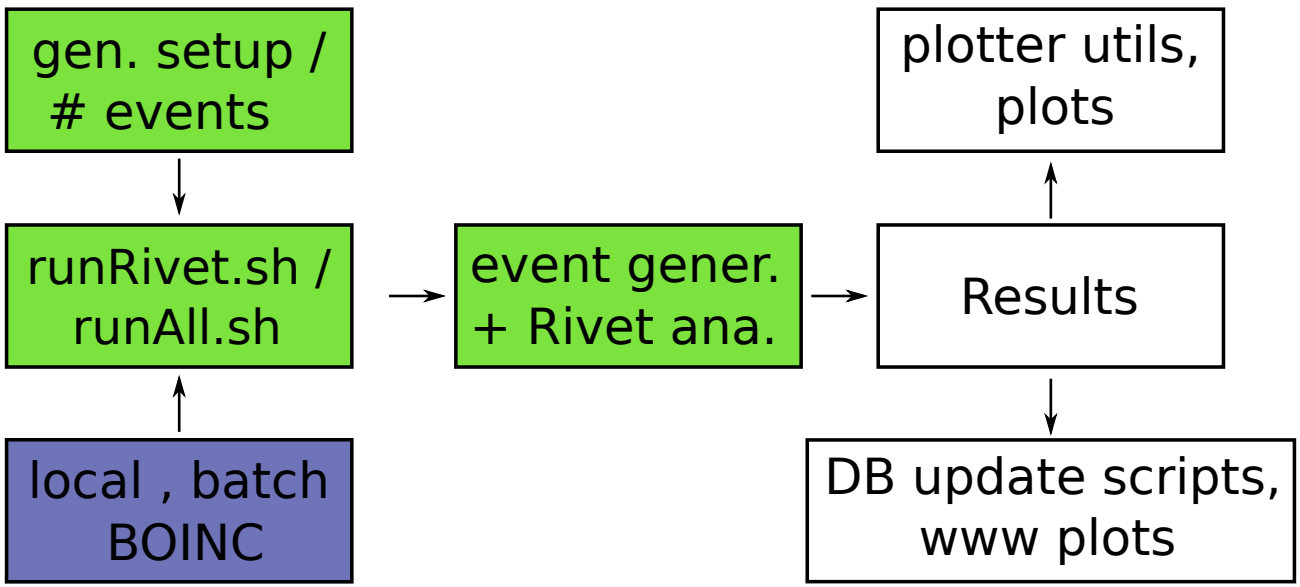
Alpgen Implementation - 2

- Gen. setup and passing # of events more elaborate for Alpgen than for other implemented generators,
- need to take into account more parameters (Njets, Excl./Incl. flag, filter parameters . . .).



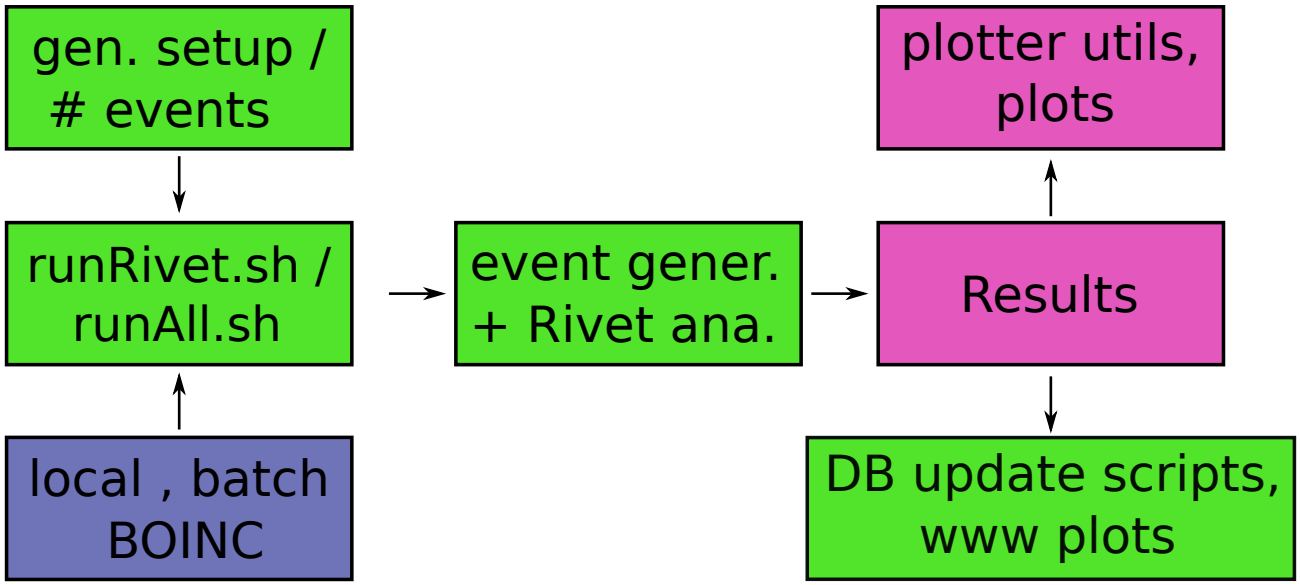
Alpgen Implementation - 3

- Even submission mode requires additional effort ;-)
  (Herwig + Jimmy crashing in batch).



Alpgen Implementation - 4

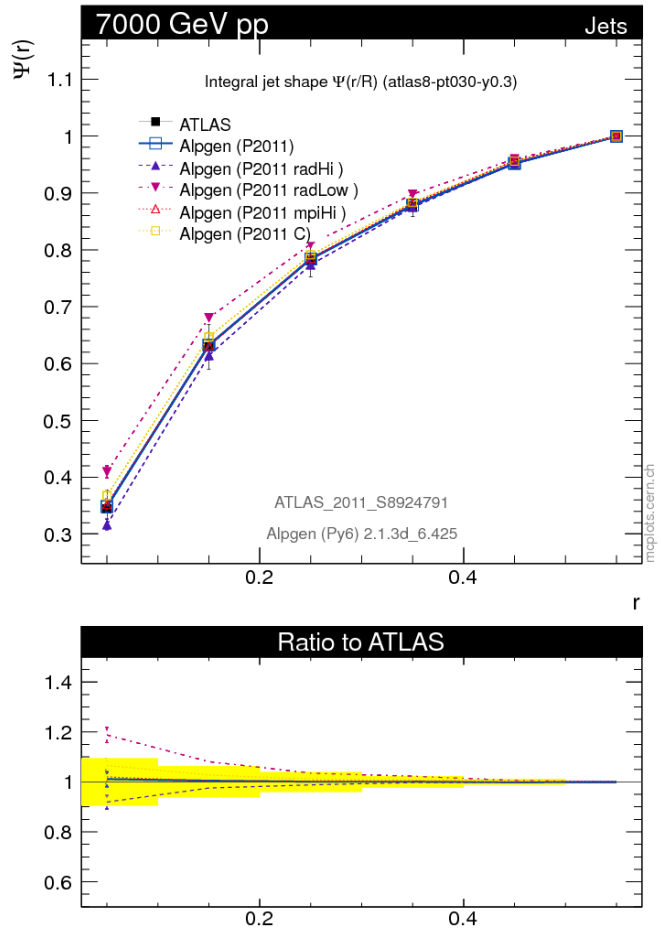
- Alpgen full chain runs well for any parton multiplicity,
- but histo adding not yet supported in MCPLOTS;
- we have organized some single-multiplicity plots in the dev. pages.



Alpgen Implementation - 6

- **Alpgen runs in MCPLOTS framew.,**
- no physics/tuning inputs out of the box yet (no histo adding).
- RHS: QCD jets $2 \to 2$, Alpgen + Pythia, P2011 tunes family.
- All the plots for the supported processes duly filled,
- features like non-default pdf-s, filters have been tested.

- Room for improvement on the generator-setup side:
- requesting a fixed # of events to be filled in the histo not an optimal strategy for Alpgen,
- MCPLOTS not yet optimized for potential CPU-intensive Alpgen runs.



http://mcplots-dev.cern.ch/

Alpgen Implementation - 7

```
#-------------------------------------------------------------------------------------------
# top weighted events steering file
[genwgt]
1                ! imode
fname          ! label for files
0                ! start with: 0=new grid, 1=previous warmup grid, 2=previous generation grid
1000000 3 ! Nevents/iteration,  N(warm-up iterations)
30000000          ! Nevents generated after warm-up
ebeam   3500.
ih2     1
njets   2
ndns    5
ickkw   1.
ptjmin  15
drjmin  0.7
etajmax 4.0
iseed1 271828
iseed2 271828
iseed3 271828
iseed4 271828
#-------------------------------------------------------------------------------------------
# user-defined filtering at the weighted events level
[filter]
FILTERNAME PTLEAD
#PTLEAD_MIN 20.0
#PTLEAD_MAX 3500.
PTLEAD_MIN  10
PTLEAD_MAX  7000
#-------------------------------------------------------------------------------------------
# top unweighted events steering file
[genuwgt]
2        ! imode
fname  ! label for files
#-------------------------------------------------------------------------------------------
[steerPS]
#Pythia steering in Agile-params format
MSTP(5) 320
# Makes particles with c*tau > 10 mm stable:
MSTJ(22) 2
PARJ(71) 10.0
#-------------------------------------------------------------------------------------------
```

MCPLOTS Links

- **Project pages:**
  - `http://mcplots.cern.ch/`
  - `http://mcplots-dev.cern.ch/`
  - `http://svnweb.cern.ch/world/wsvn/mcplots/`
- **DESY Contribution Docu:**
  - `https://wiki.terascale.de/index.php/Mcplots`
- **Running MCPLOTS:**
  - `http://svnweb.cern.ch/world/wsvn/mcplots/trunk/doc/readme.txt`
  - `svn co https://svn.cern.ch/reps/mcplots`
  - Give it a try in case you are having problems running Alpgen with Agile+Rivet :-).