

Herwig++ 2.4

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- Last Genser overview talk: November 2007 on Herwig++ 2.1
- Version 2.4 released last month
- available through Genser

- Comprehensive description of physics and user manual published in March 2008
- Updated with every major release
- `arxiv:0803.0883`
- Eur.Phys.J. C58:639-707, 2008

- Many new matrix elements:
 - $W / Z + \text{jet, photon, Higgs}$
 - W / Z pairs
 - VBF Higgs
 - Higgs + heavy quark pairs

`share/Herwig++/LHC.in`

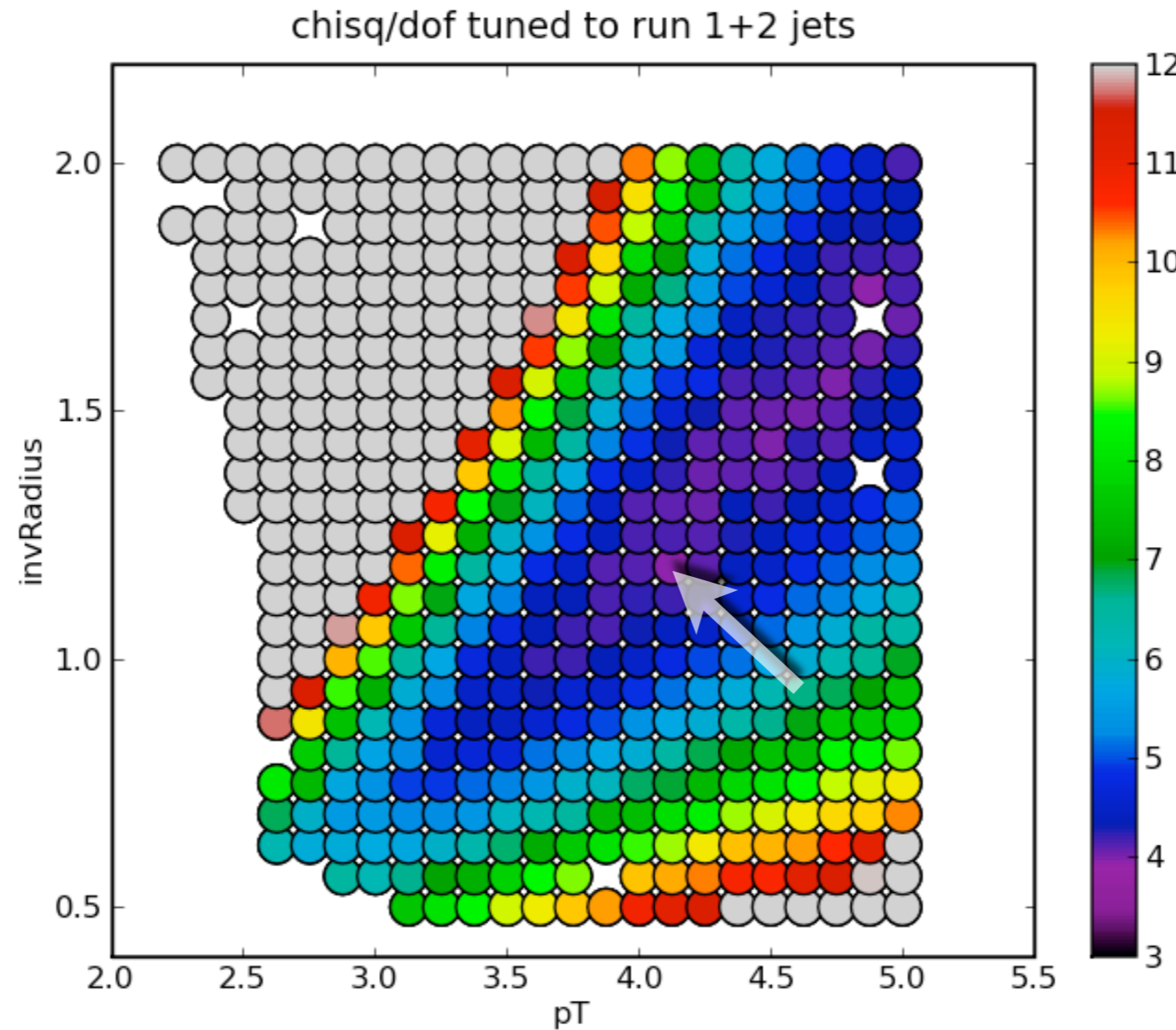
- New classes of matrix elements:
 - DIS charged and neutral current processes
 - $\gamma\gamma$ to WW / ff

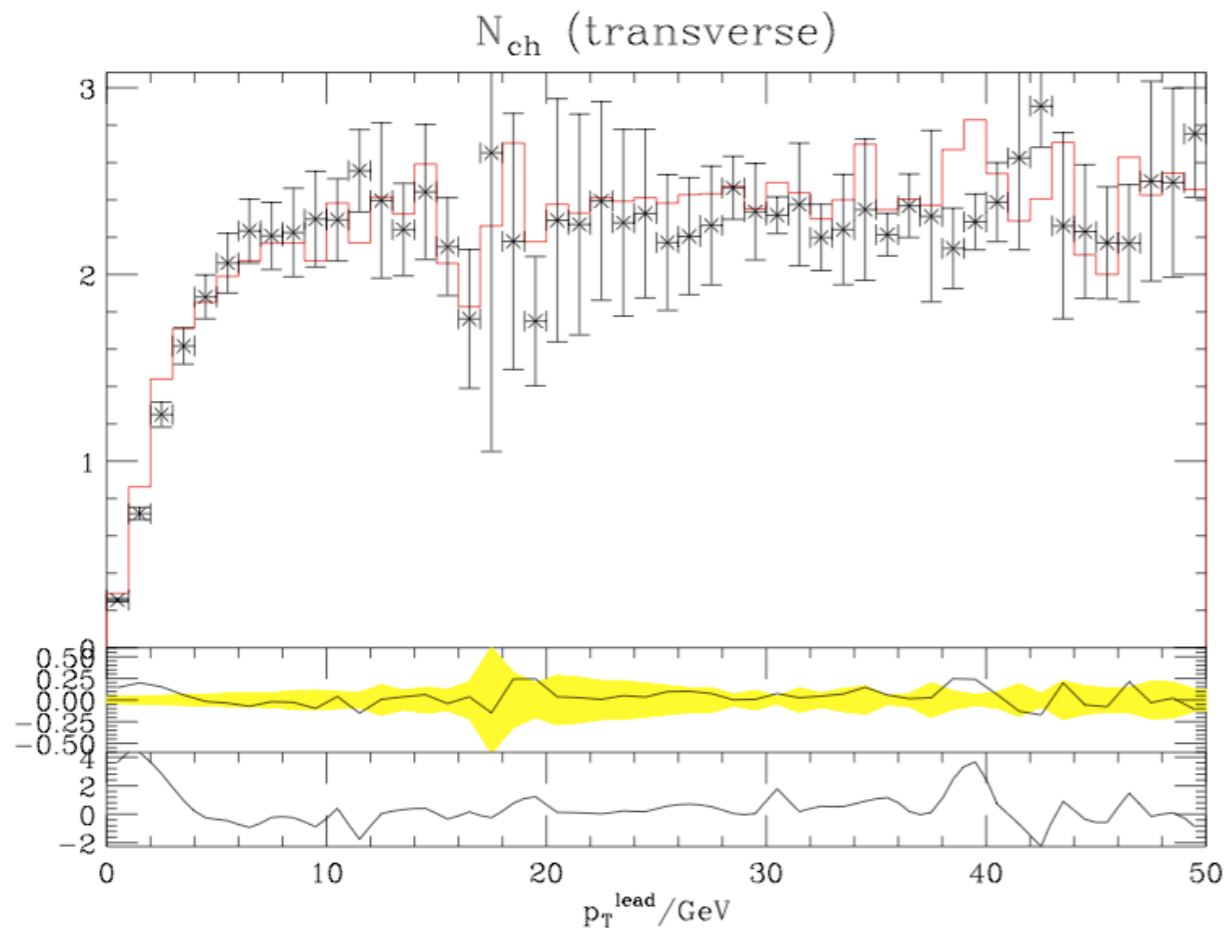
```
share/Herwig++/DIS.in  
share/Herwig++/GammaGamma.in
```

- New default PDF set:
 - MRST LO**
 - retuned to LEP data
 - UE parameters available for LO** and LO*

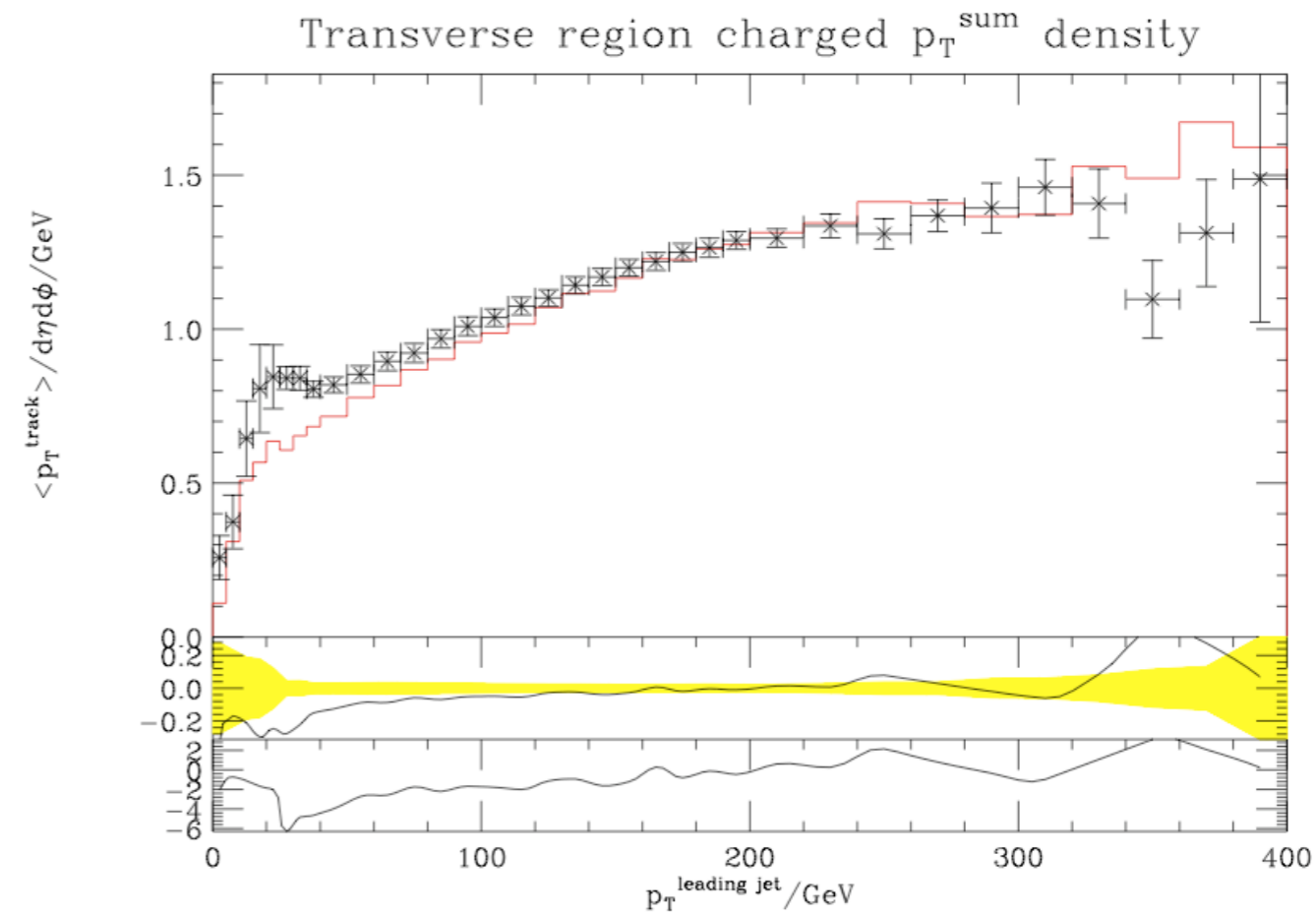
- Underlying event physics:
 - Minimum bias events
 - Multiple defined hard scatters
- QED decay radiation switched on by default

- New tune of underlying event parameters:



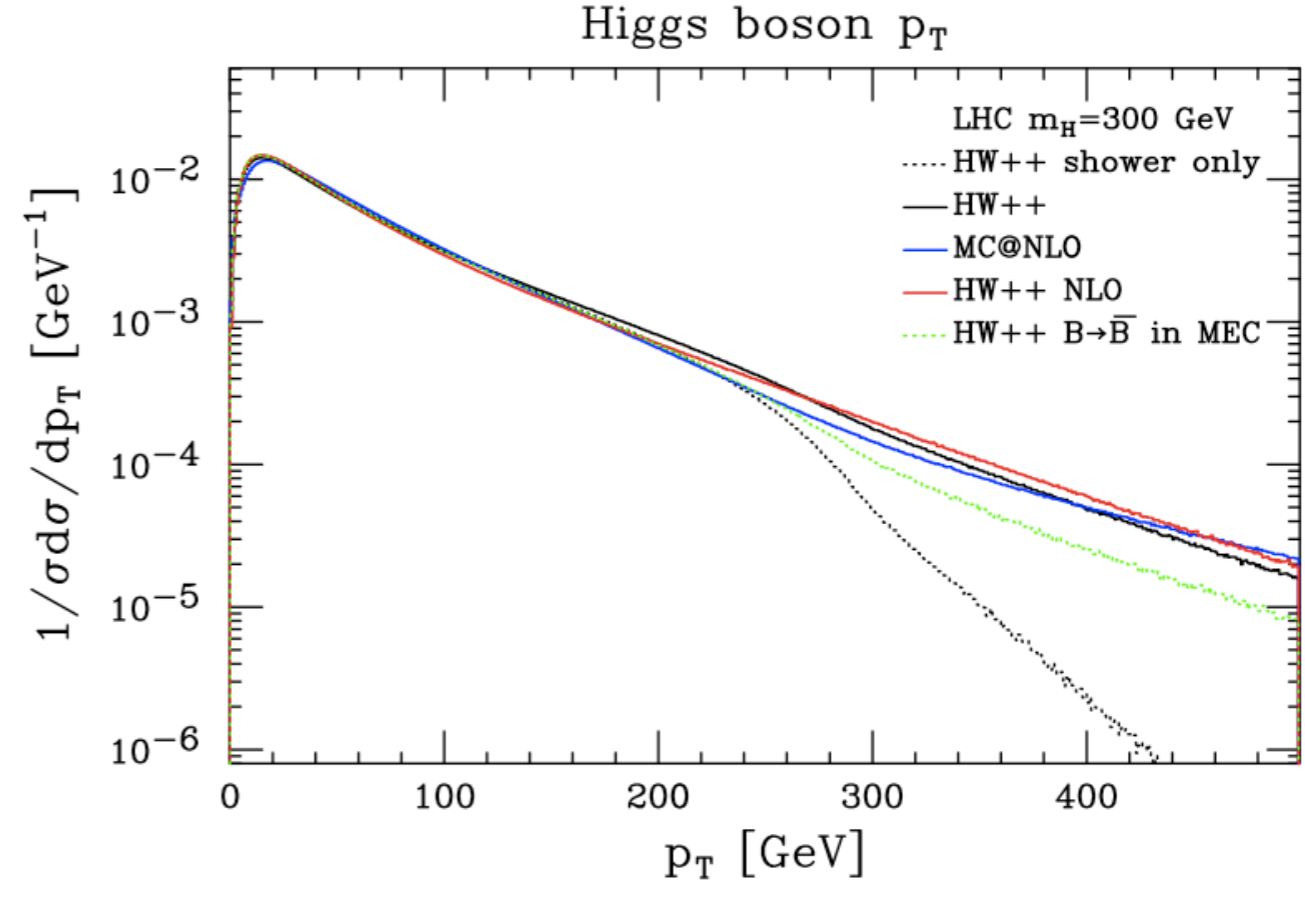
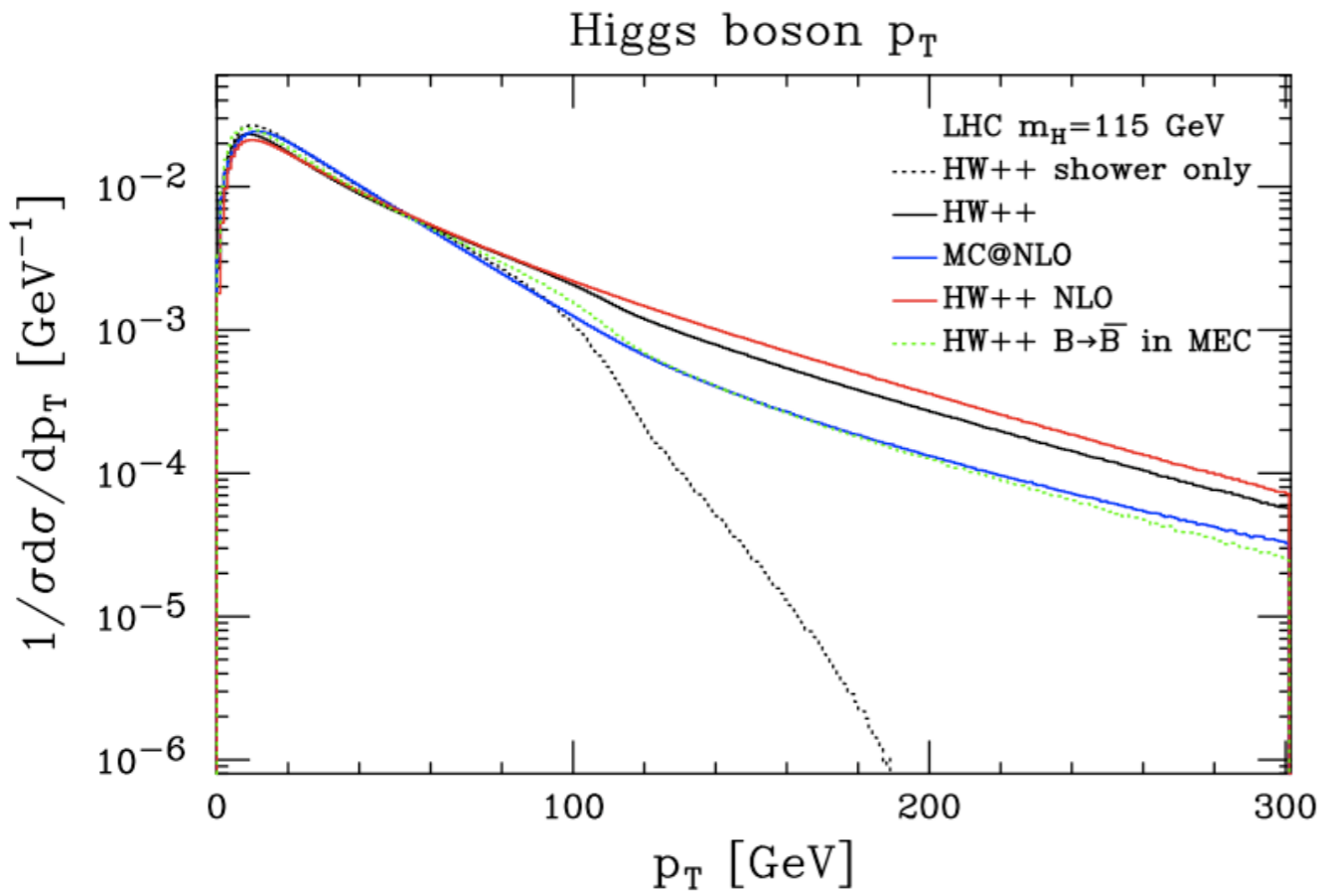


CDF run 1 data



CDF run 2 data

- POWHEG NLO shower matching for:
 - Drell-Yan
 - $W / Z + \text{Higgs}$
 - $gg \rightarrow \text{Higgs}$



Higgs mass

115 GeV

300 GeV

- **BSM model improvements:**
 - automatic calculation of 3-body decays
 - exclusive production

```
set HPConstruktor:Processes  
  SingleParticleInclusive  
  TwoParticleInclusive  
  Exclusive
```

- **Decayers:**
 - already had individually modelled decayers for meson decays
 - Now extended to most baryon decays

- HepMC
 - use of code 11 for internal particles (better not use for analysis)
 - use of code 2 now restricted to

a decayed Standard Model hadron or tau or mu lepton, excepting virtual intermediate states thereof (i.e. the particle must undergo a normal decay, not e.g. a shower branching)

- **Structural changes:**
 - **built-in analyses use Fastjet**
 - **no remaining CLHEP dependencies**
 - **built-in use of Rivet analyses avoids passing HepMC files**

```
create ThePEG::RivetAnalysis RivetTest RivetAnalysis.so
insert RivetTest:Analyses 0 CDF_2001_S4751469
insert RivetTest:Analyses 1 [...]
[...]
```

- Implemented requests:
 - Shower and UE PDFs can be set individually
 - Most output can be directed to stdout instead of various log files

- **Contact address:**

```
herwig@projects.hepforge.org
```

- **Bug tracker:**

```
http://projects.hepforge.org/herwig/trac
```