

**GUIDO MONTAGNA**  
UNIVERSITÀ DEGLI STUDI DI PAVIA  
DIPARTIMENTO DI FISICA NUCLEARE E TEORICA  
I.N.F.N. - SEZIONE DI PAVIA



**PR21**  
**Fenomenologia**  
**delle Particelle Elementari**

**Partecipanti 2007(2008)**

G. Balossini  
G. Bormetti \*  
M. Brambilla \*  
C.M. Carloni Calame \*  
G. Montagna  
O. Nicrosini  
F. Piccinini  
+ E. Cisana

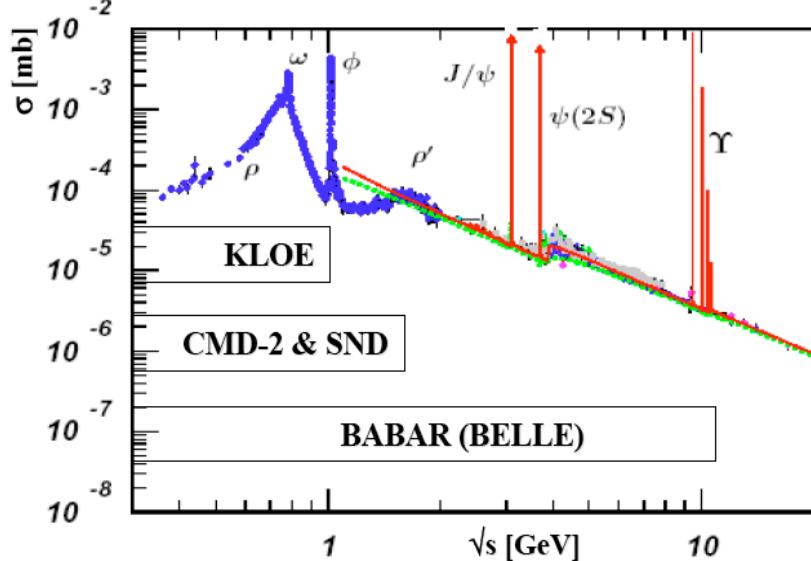
Responsabile nazionale: P. Nason (MIB)

<http://www.pv.infn.it/hepcomplex>

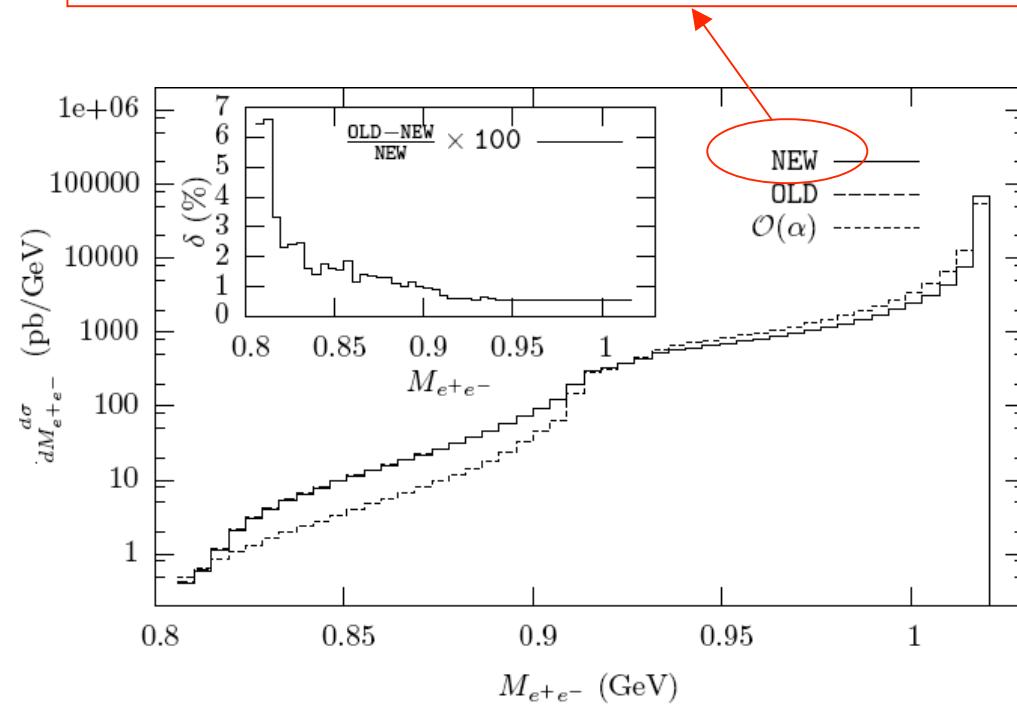
**Consiglio di Sezione INFN**  
**Pavia, 3 maggio 2007**

# BabaYaga@NLO at e+e- colliders (DAFNE, CESR, PEP-II...)

Precision measurements at e+e- colliders between 1 GeV - 10 GeV require a knowledge of **luminosity** at a **0.1% accuracy** (QED processes)



New BabaYaga with 0.1% precision  
used by KLOE, FINUDA, CLEO, BABAR...



G. Balossini *et al.*, Nucl. Phys. **B578** (2006) 227

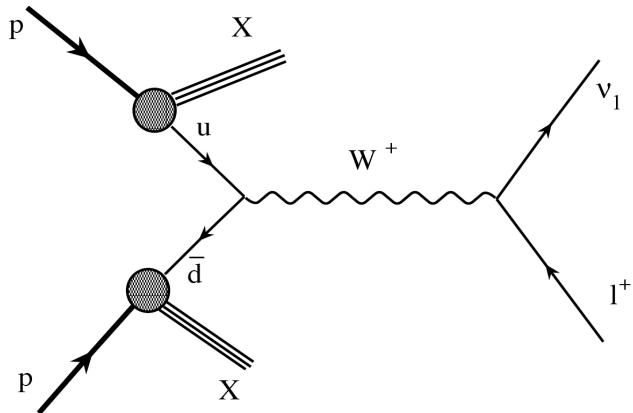
Talk by F. Piccinini at ICHEP06, Moscow, Jul 2006, hep-ph/0609313

Talk by C.M. Carloni Calame and G. Montagna

at WG Hadronic Cross Section and Luminosity, LNF, Oct 2006

gamma gamma production with 0.1%  
accuracy in progress

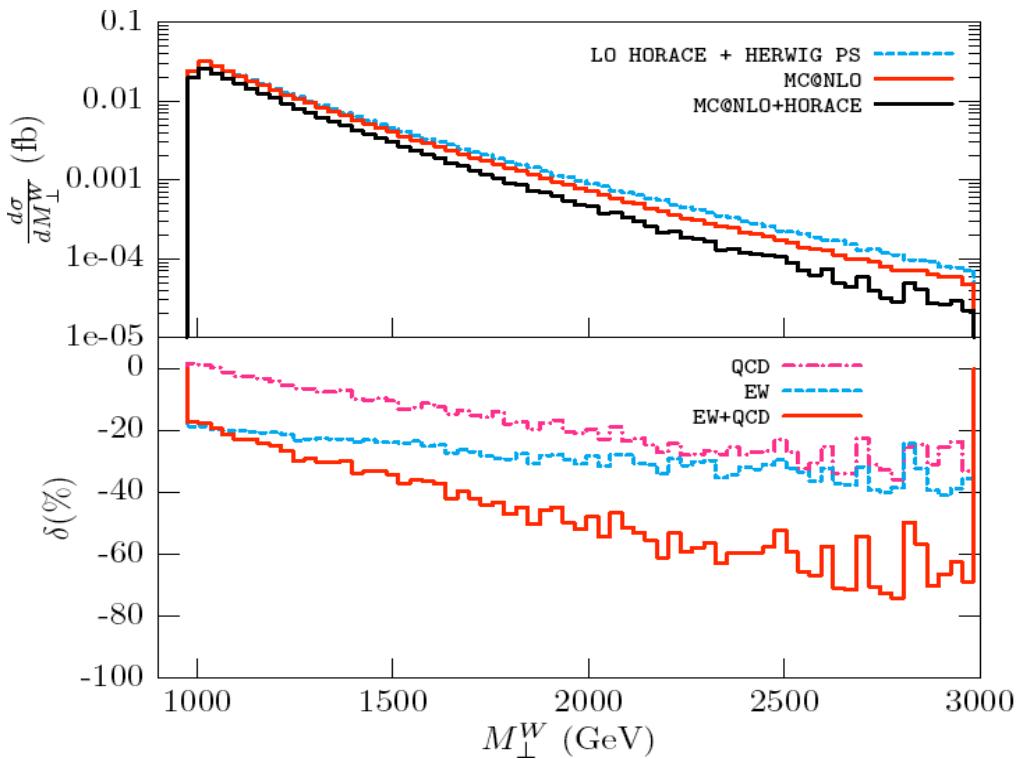
# Electroweak + QCD corrections to Drell-Yan processes at the Tevatron and LHC



In collaboration with  
CDF & D0 coll.  
ATLAS & CMS coll.  
M. Moretti, M. Treccani and A. Vicini

C.M. Carloni Calame, G. Montagna, O. Nicrosini, A. Vicini  
JHEP **0612** (2006) 016

G.E. Gerber *et al.* "TeV4LHC report: Top and electroweak physics", FERMILAB-CONF-07-052



Presented at

CIPANP 2006, Puerto Rico, Jun 2006 (F. Piccinini) AIP Conf. Proc. **870** (2006) 436

INFN Monte Carlo Workshop, LNF (C.M. Carloni Calame and G. Montagna)

Cracow Epiphany conference, Jan 2007 (F. Piccinini)

HERA4LHC workshop, DESY, Mar 2007 (F. Piccinini)

Loop Fest VI, Fermilab, Apr 2007 (G. Montagna)

# Upgrade and applications of ALPGEN to Tevatron/LHC physics

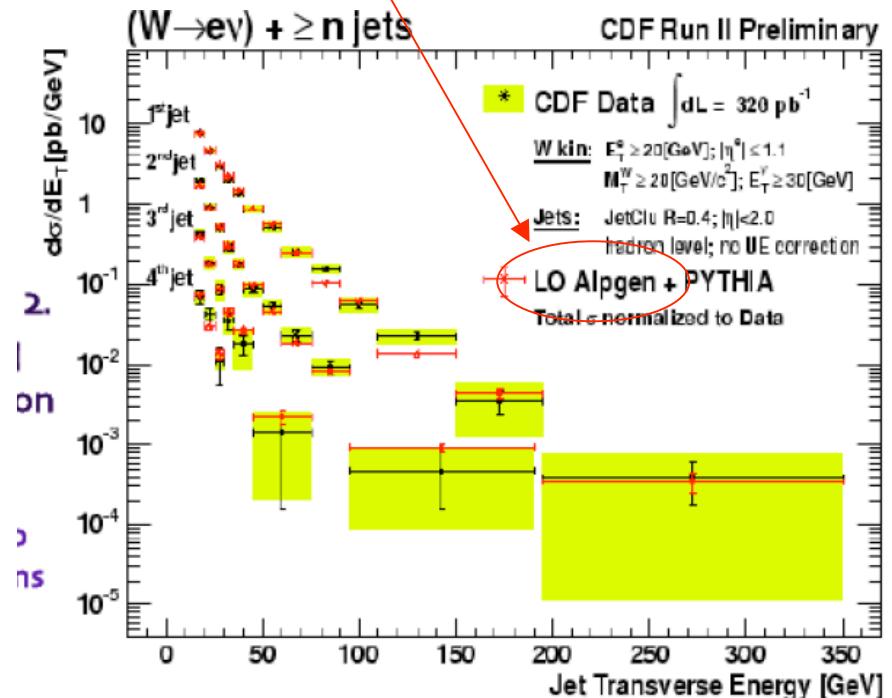
F. Piccinini, talk at ATLAS meeting, Grenoble, Oct 2006  
F. Piccinini, talk at ATLAS Higgs WG, CERN, Apr 2007  
F. Piccinini, CMS note in preparation ( $t\bar{t}$  gamma gamma)

Monte Carlo studies of the jet activity in Higgs +  
2 jets events  
JHEP **0610** (2006) 016  
with V. Del Duca, M.L. Mangano, D. Zeppenfeld *et al*

Matching matrix elements and shower evolution in  
top-quark production in hadronic collisions  
JHEP **0701** (2007) 013  
with M.L. Mangano, M. Moretti and M. Treccani

Higgs boson production in association with a photon  
in vector boson fusion at the LHC  
hep-ph/0702119  
with E. Gabrielli, F. Maltoni, B. Mele *et al*

W + n jets with ALPGEN at CDF Run II



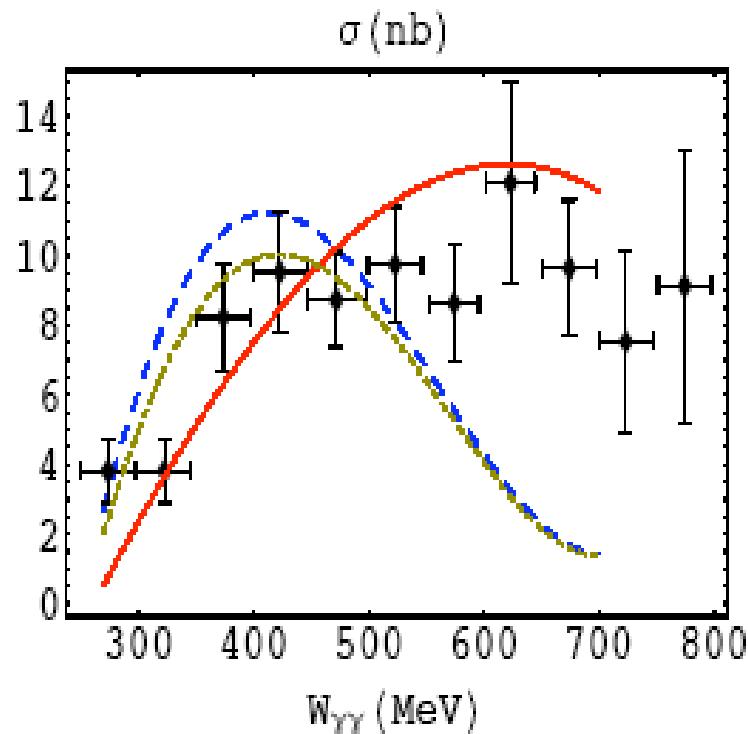
# New hadrons spectroscopy in a diquark-antidiquark model

F. Nguyen, F. Piccinini and A.D. Polosa  
 $e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$  at DAPHNE  
Eur. Phys. J. **C47** (2007) 65

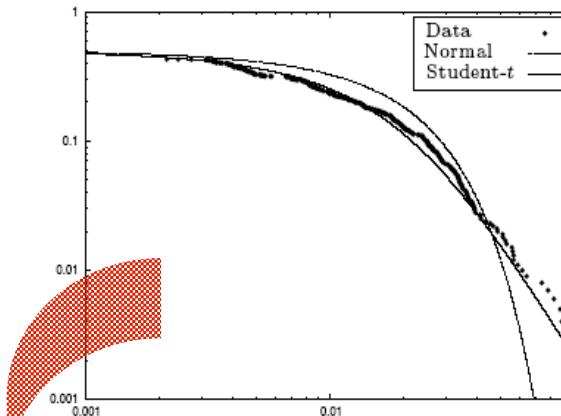
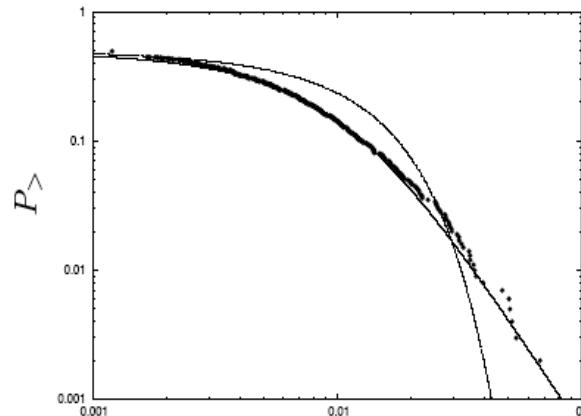
L. Maiani, F. Piccinini, A.D. Polosa, V. Riquer  
Positive parity scalar mesons in the 1 GeV - 2 GeV  
mass range  
Eur. Phys. J. **C50** (2007) 609

F. Piccinini  
New hadrons as four-quark states  
Nucl. Phys. **A782** (2007) 362  
5h Int. Conference on Perspectives in Hadronic Physics, Trieste, May 2006

A new sigma(500 MeV) meson in  
 $\gamma \gamma \rightarrow \pi^0 \pi^0$ ?

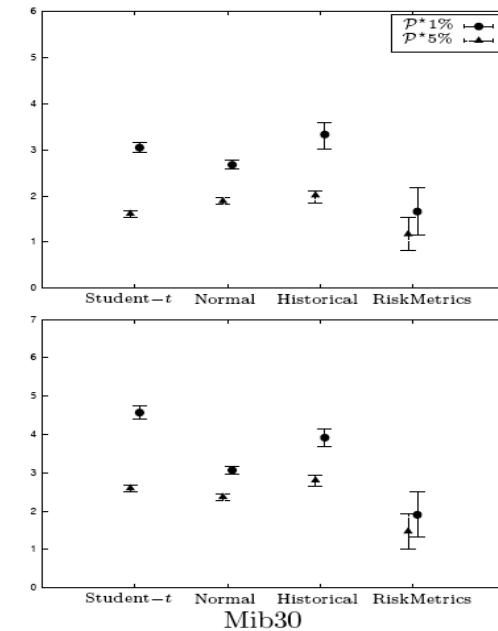
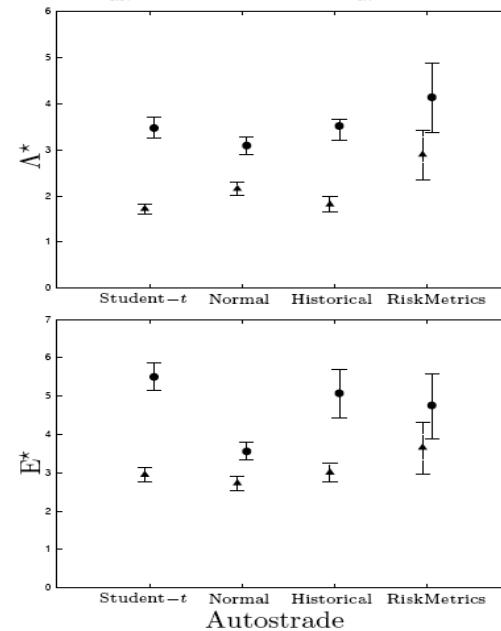


# Econophysics: risk measures with non-Gaussian fluctuations



From real financial time series...

...to financial risk measures



G. Bormetti, E. Cisana, G. Montagna, O. Nicrosini, Physica **A376** (2007) 532

Talk at APFA5, Torino, Jul 2006 and Erice, Sep 2006 (G. Bormetti)

Tesi L. Fermi: Stochastic volatility models in econophysics (Apr 2007)