MC-Data Validation

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Contributors : IIT Bombay, IIT Madras, and Goa University

Analysis Workflow

MC Models

Pythia8, Herwig 7.2 and Sherpa 2.2

DIS events generated with different event generators

MC Analysis with standard RIVET package/own RIVET macro

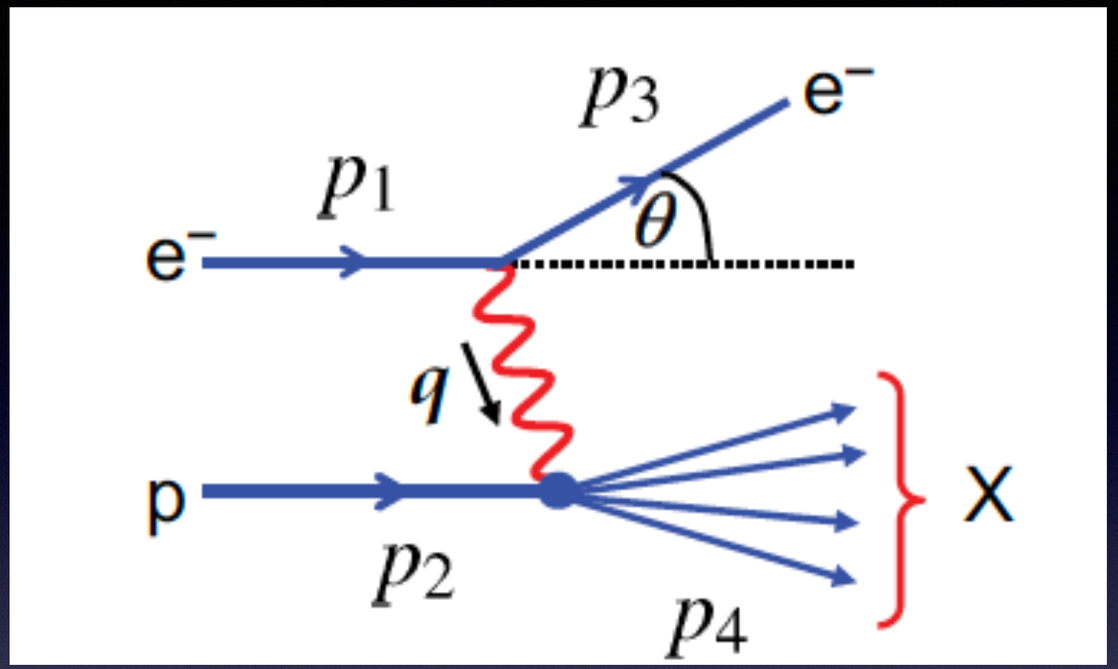
Model comparisons with H1 , Zeus Data @ HERA energies

e^+ @ 27.5 GeV and p @ 820/920 GeV

Kinematics of Inelastic Scattering

$$x \equiv \frac{Q^2}{2p_2.q}$$

$$Q^2 \equiv -q^2$$



$$M_X^2 = p_4^2 = (q + p_2)^2 = -Q^2 + 2p_2.q + M^2$$

$$Q^2 = 2p_2.q + M^2 - M_X^2 \quad \Rightarrow \quad Q^2 \leq 2p_2.q$$

$$y \equiv \frac{p_2.q}{p_2.p_1}$$

y **is the fractional energy loss of incoming particle**

$$\nu \equiv \frac{p_2.q}{M}$$

ν **is the energy lost by the incoming particle**

Charged particle multiplicity Distribution

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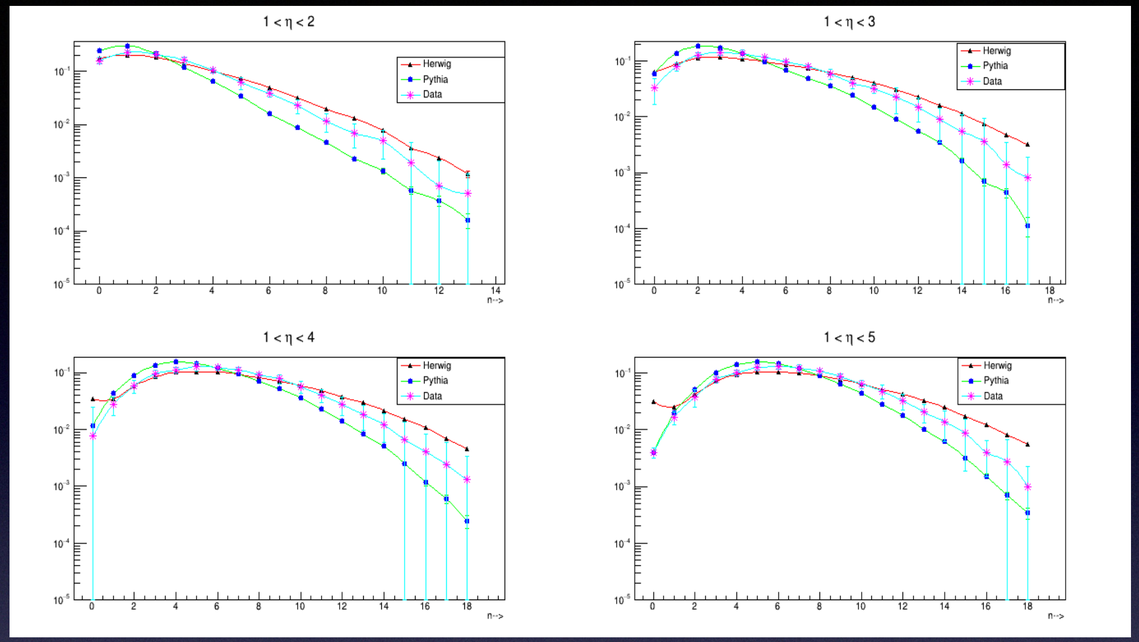
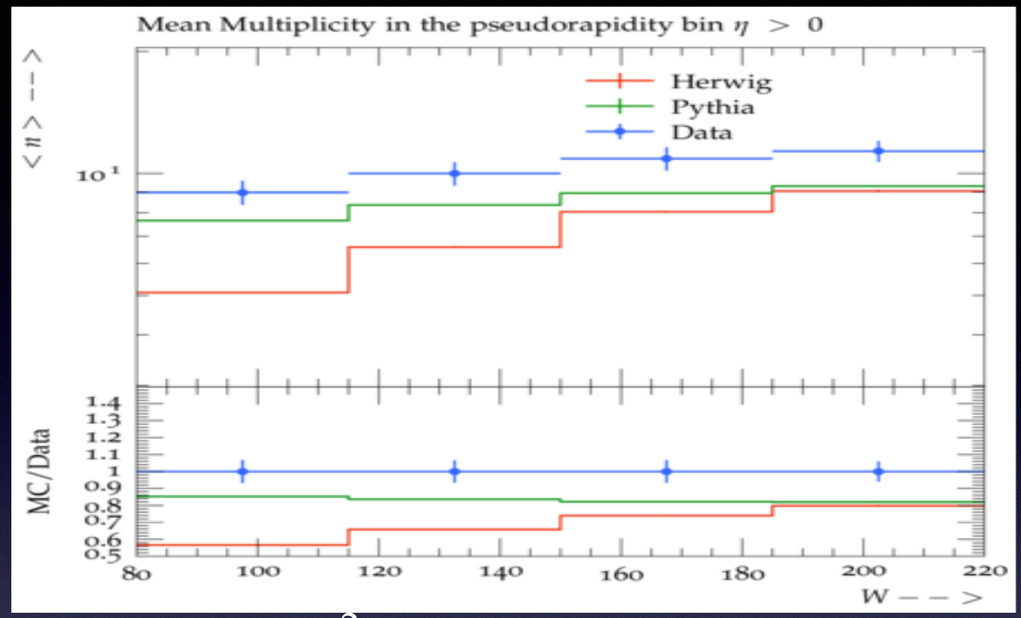
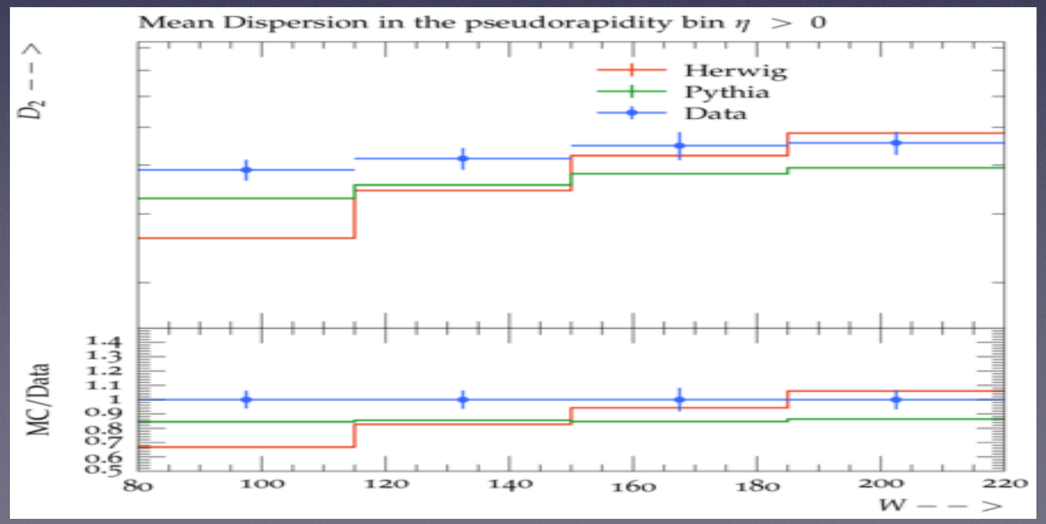
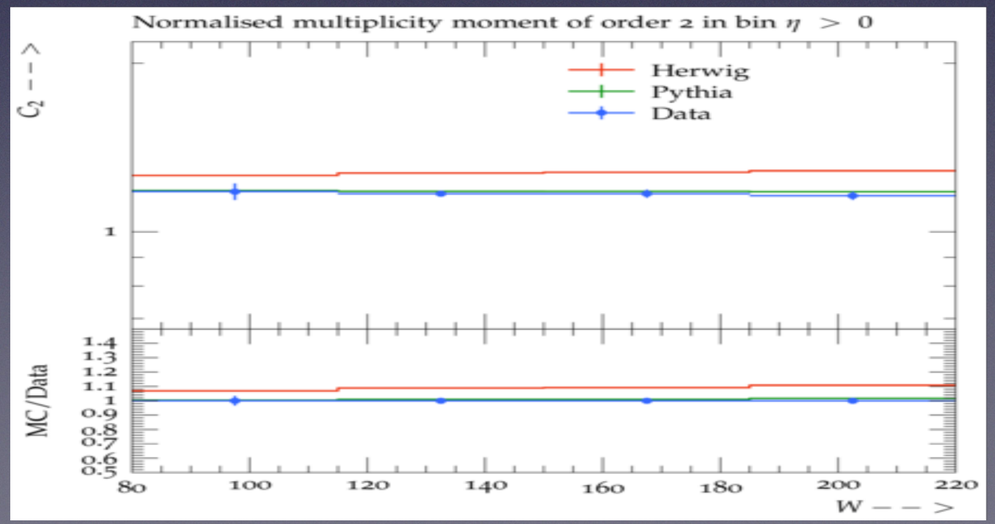




$$D_2 = < (n - < n >)^2 >^{1/2}$$

$$C_2 = \frac{< n^2 >}{< n >^2}$$





Inclusive $D^{*\pm}$ meson production

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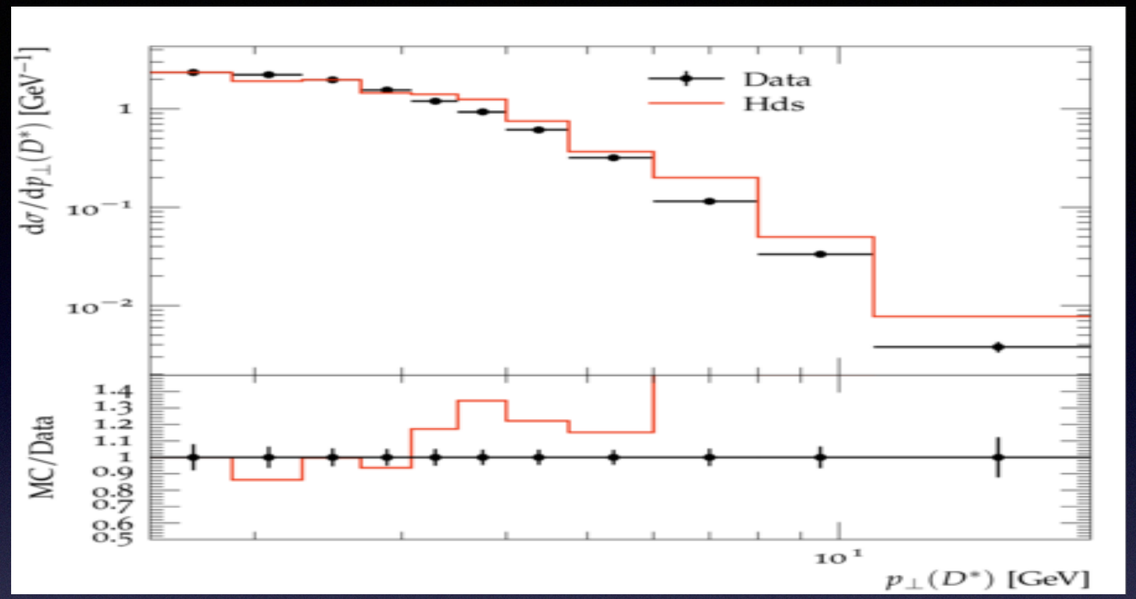

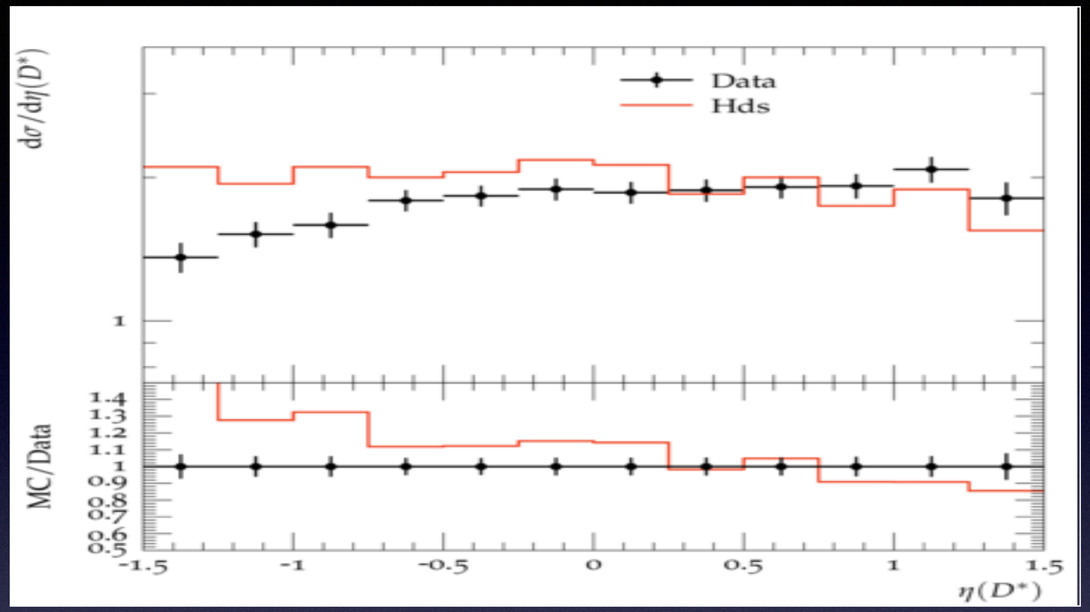

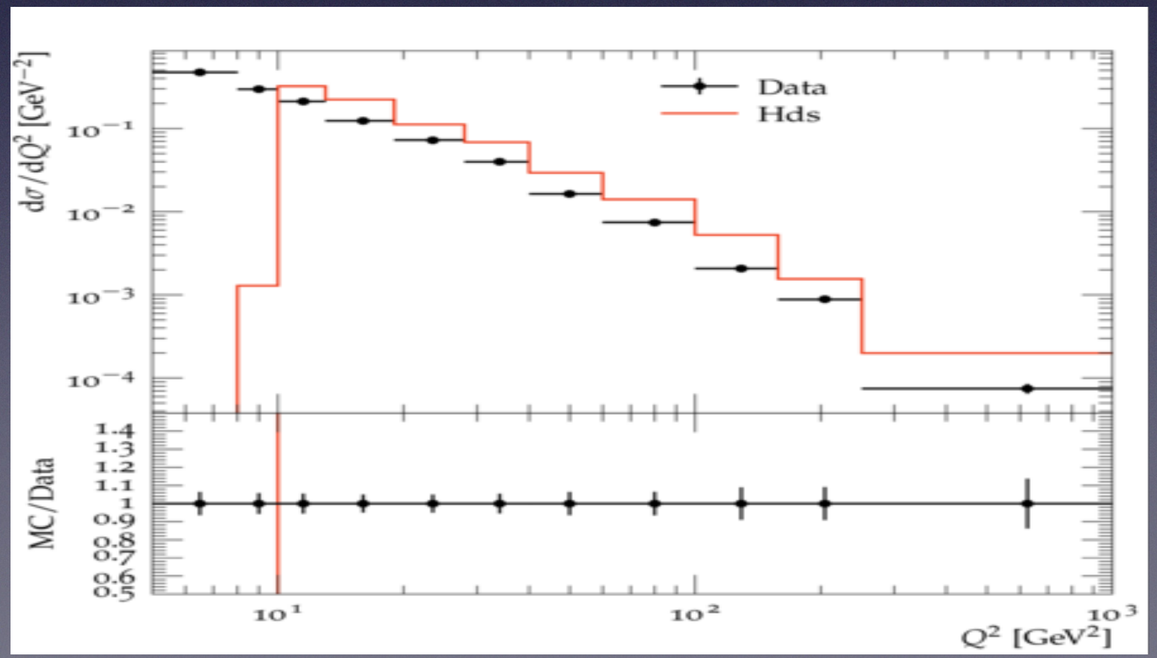

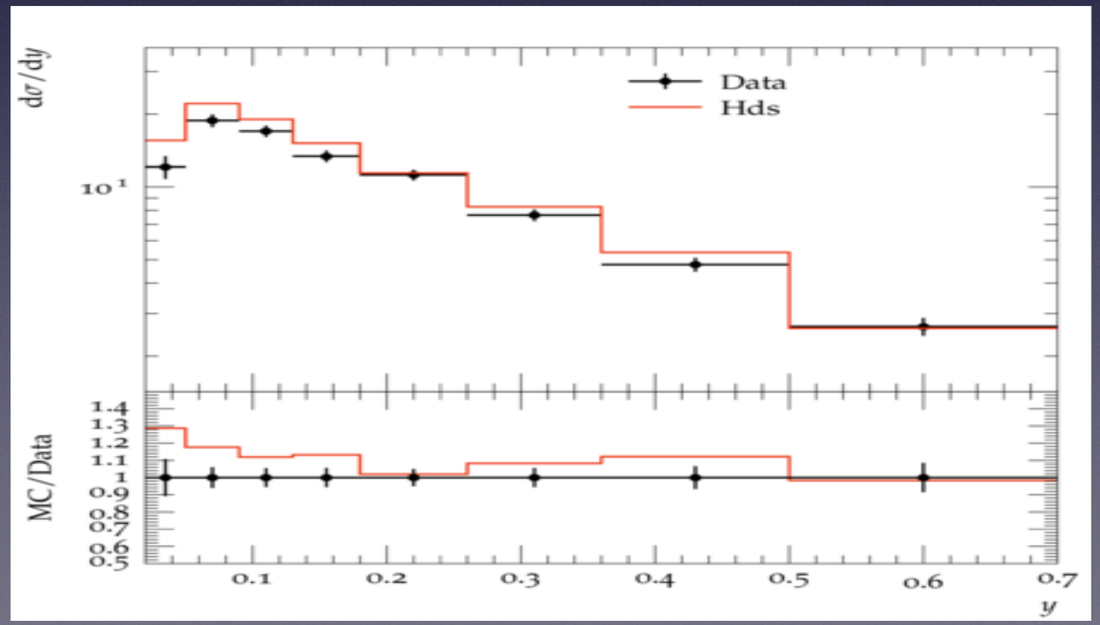

Inclusive ϕ meson production

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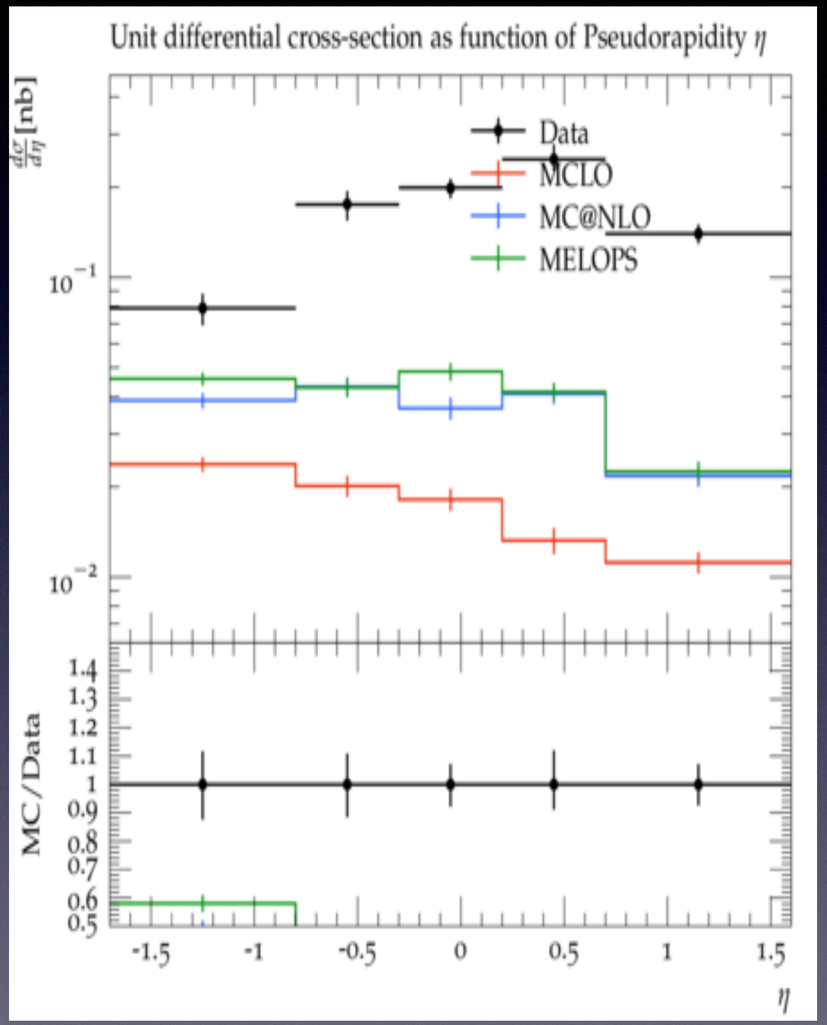

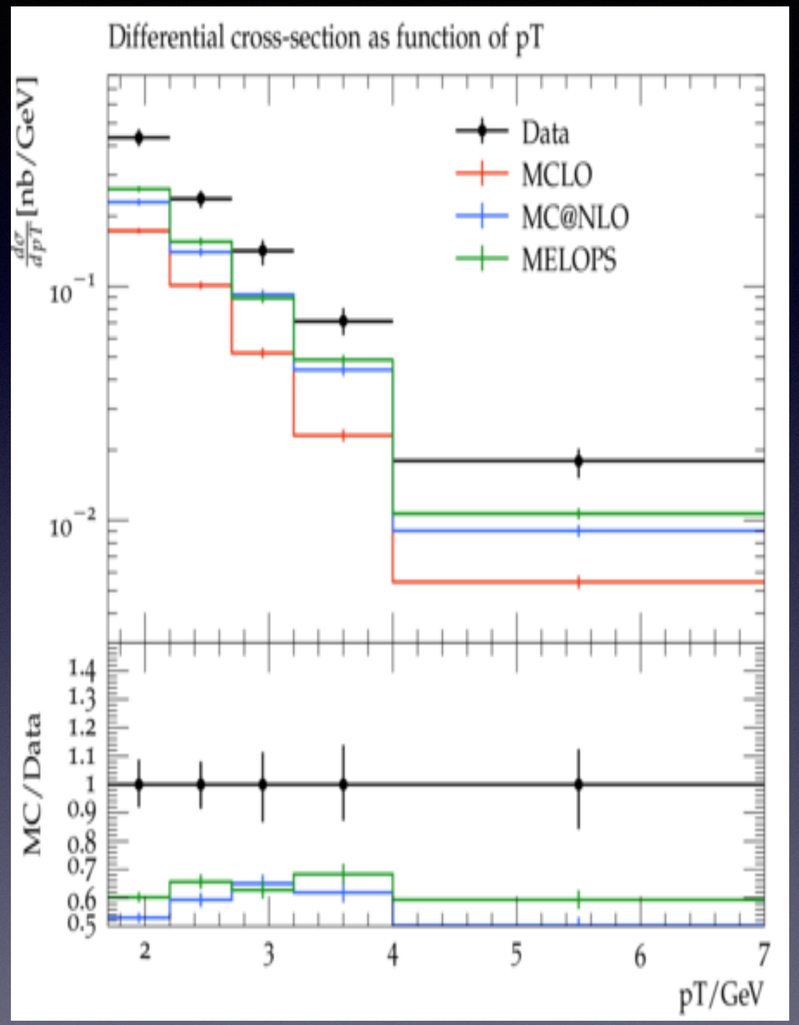

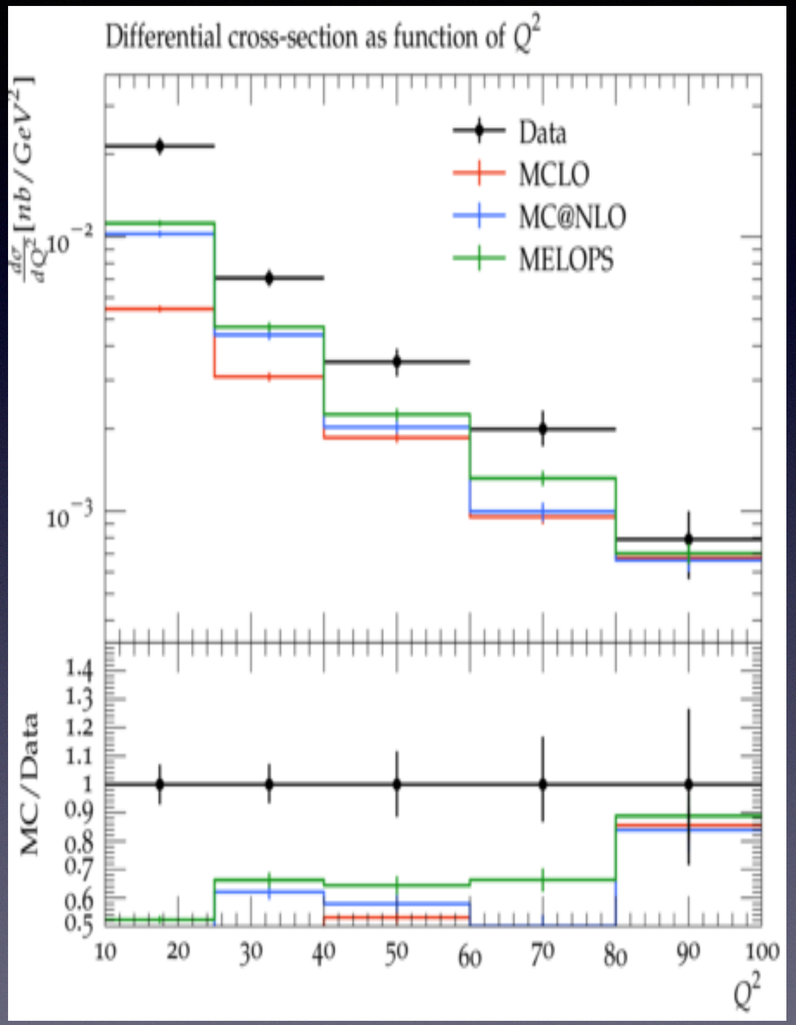

Transverse Energy Flow

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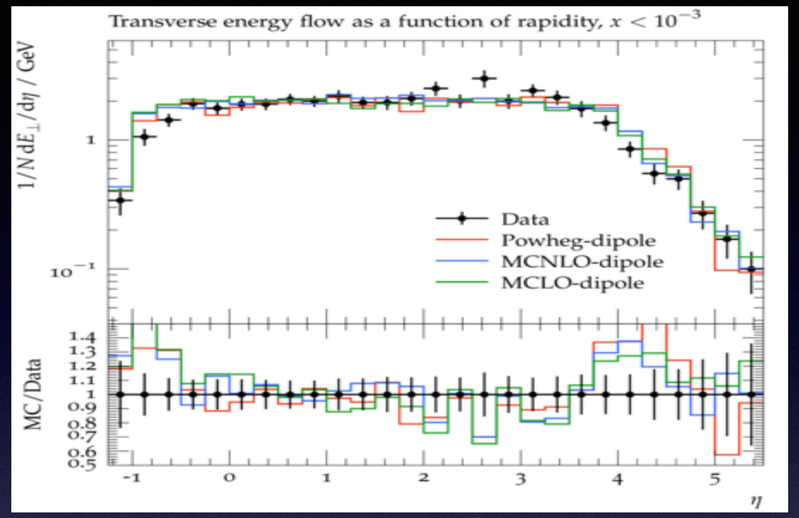
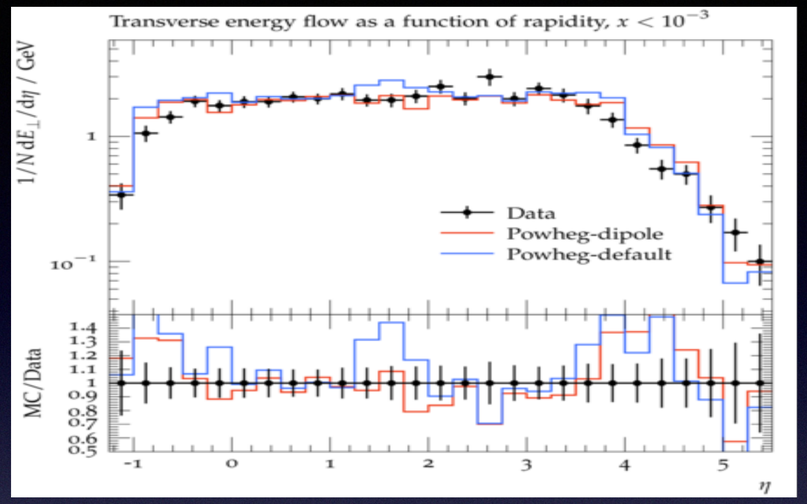
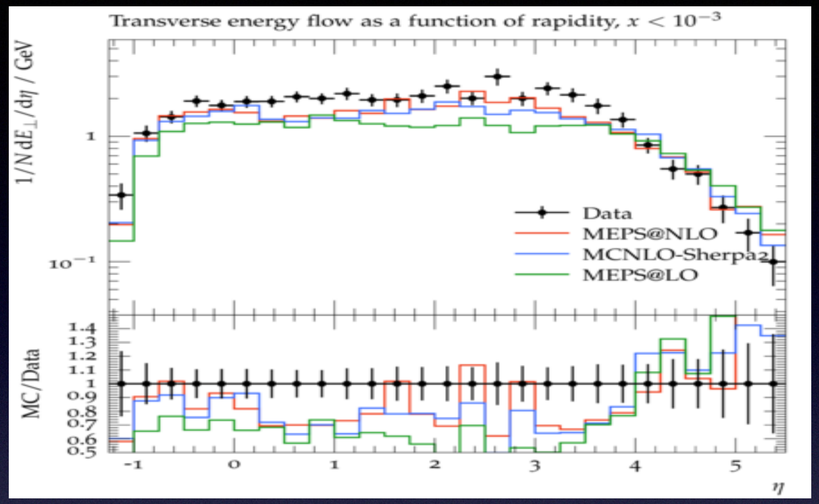
$(x < 10^{-3})$



Herwig7

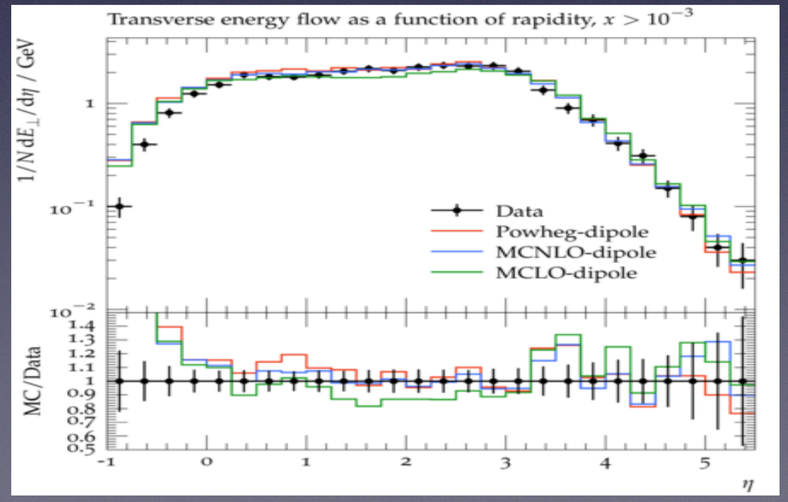


Herwig7

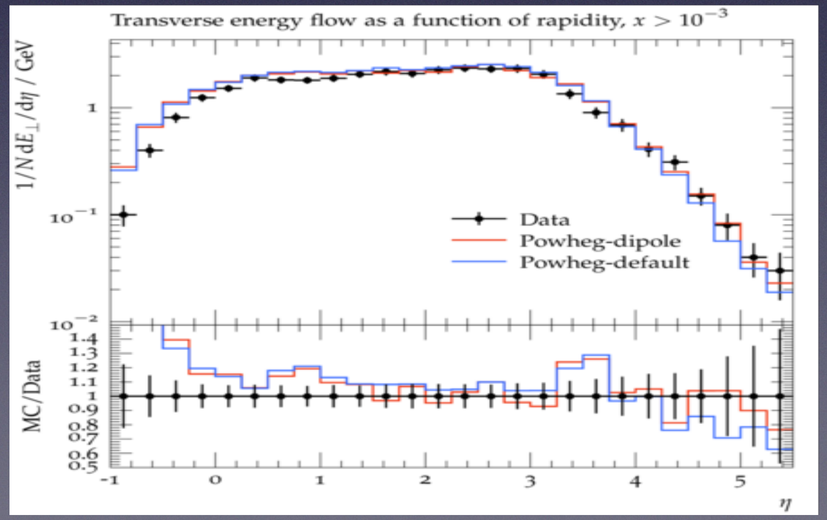


Sherpa

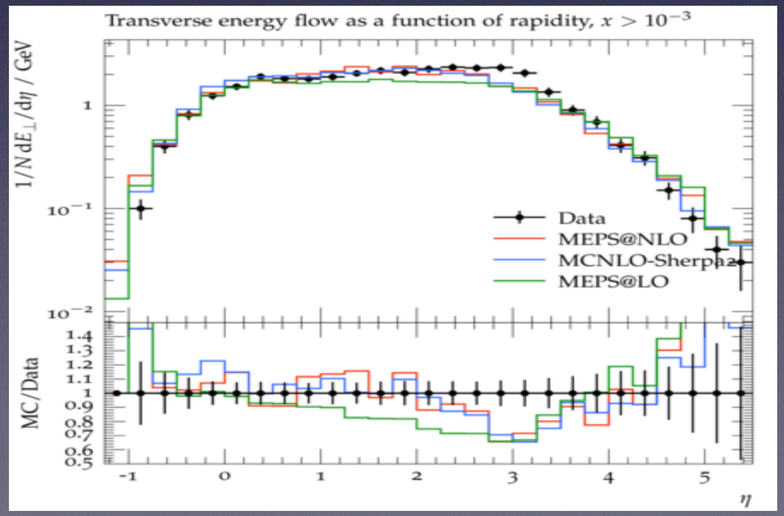
$(x > 10^{-3})$



Herwig7



Herwig7



Sherpa

Scaled Longitudinal momenta

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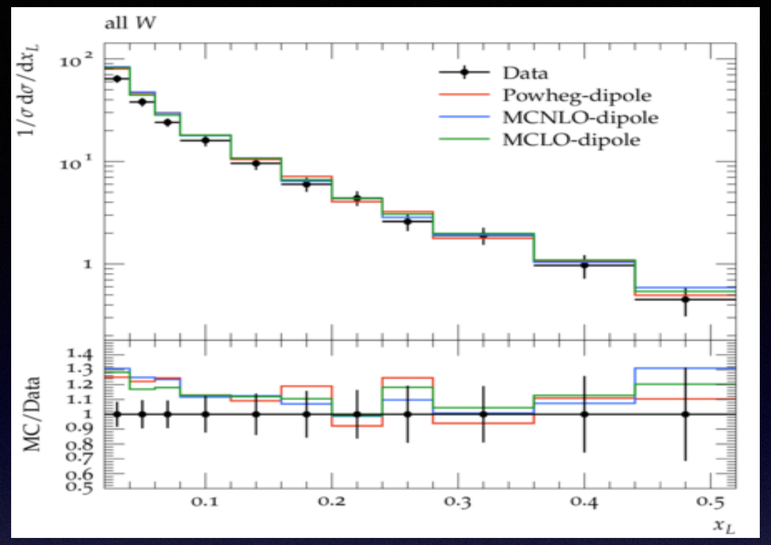
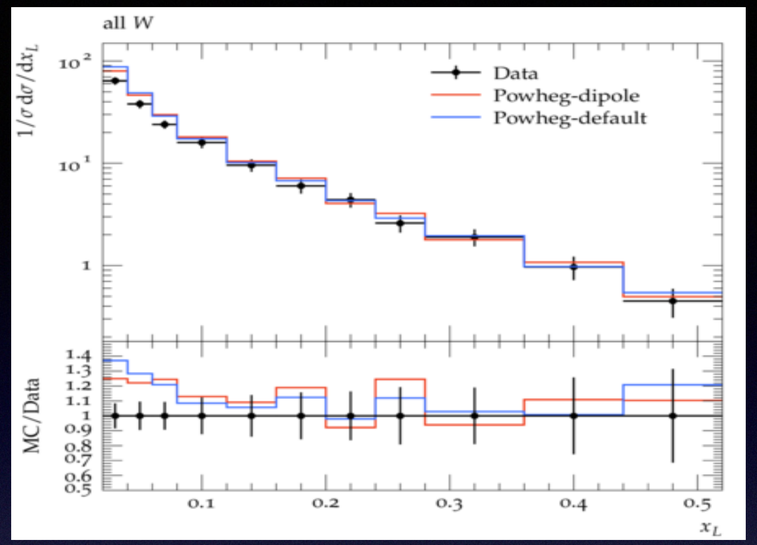


Herwig7



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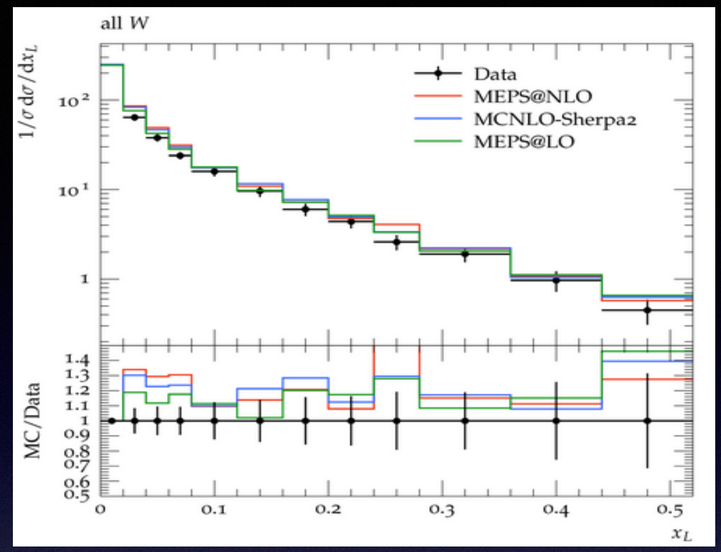
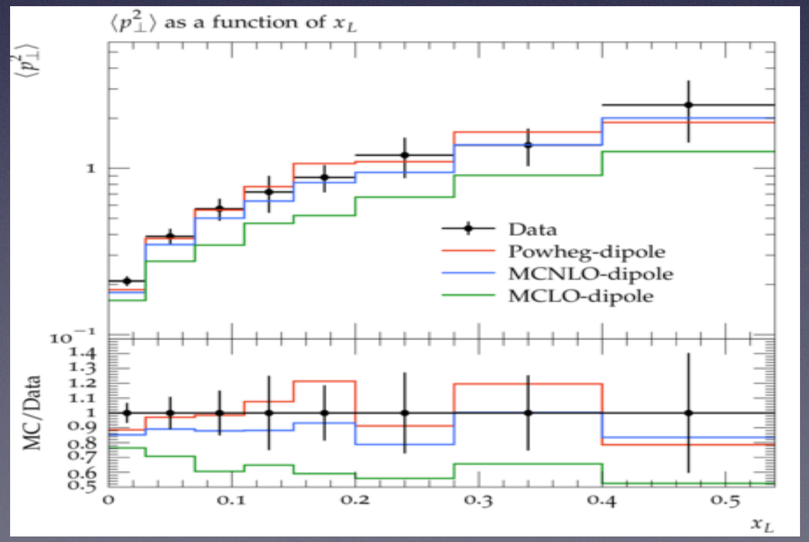


Sherpa

$< p_T^2 >$ as function of scaled momentum



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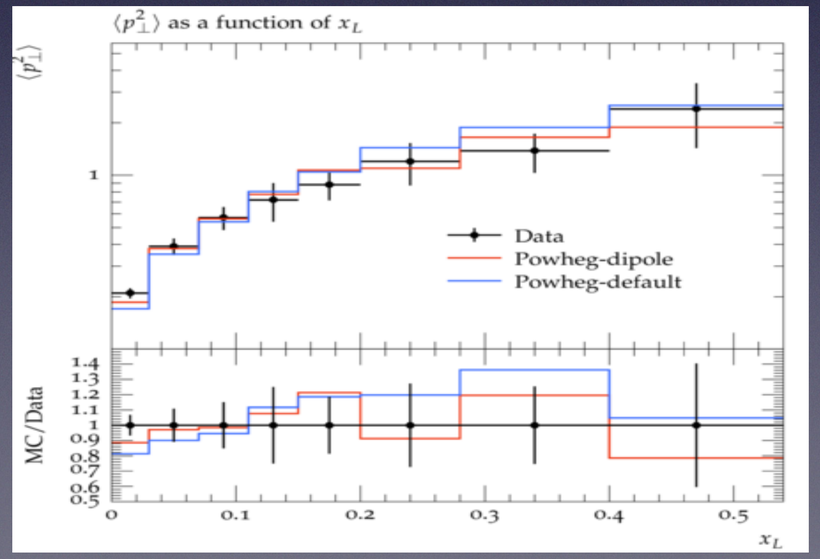

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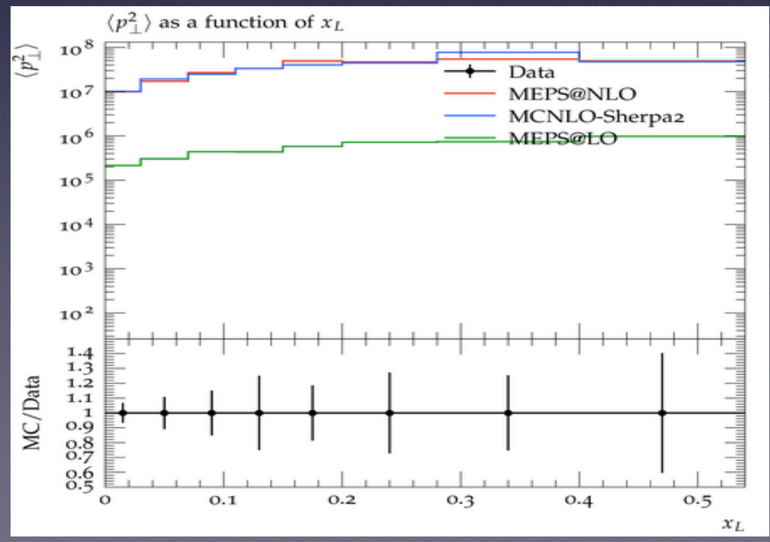
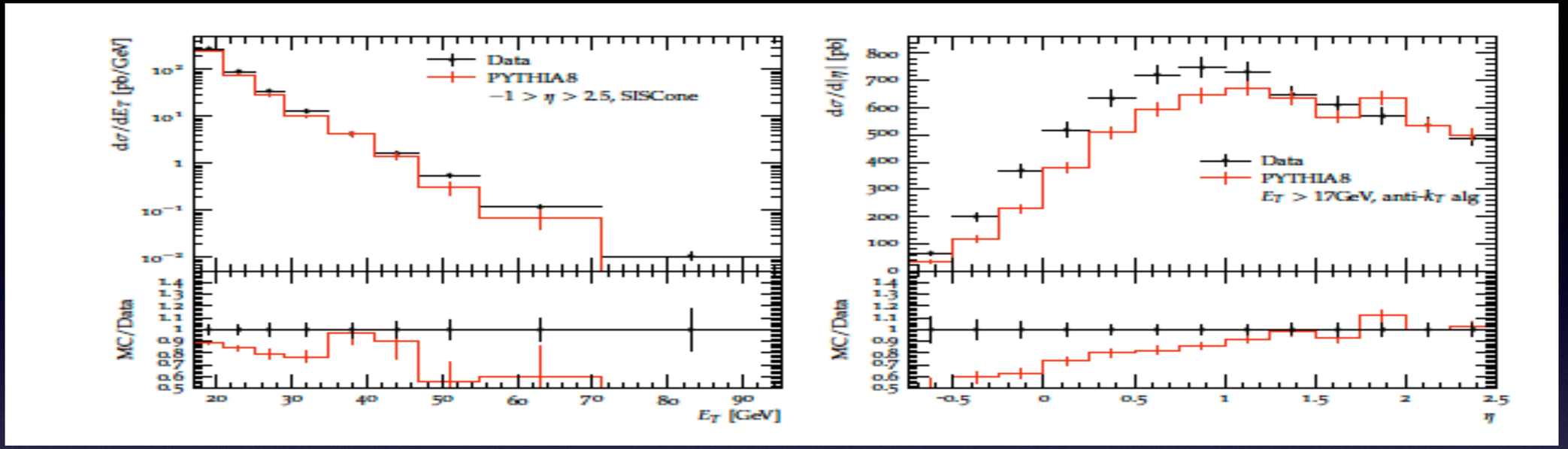
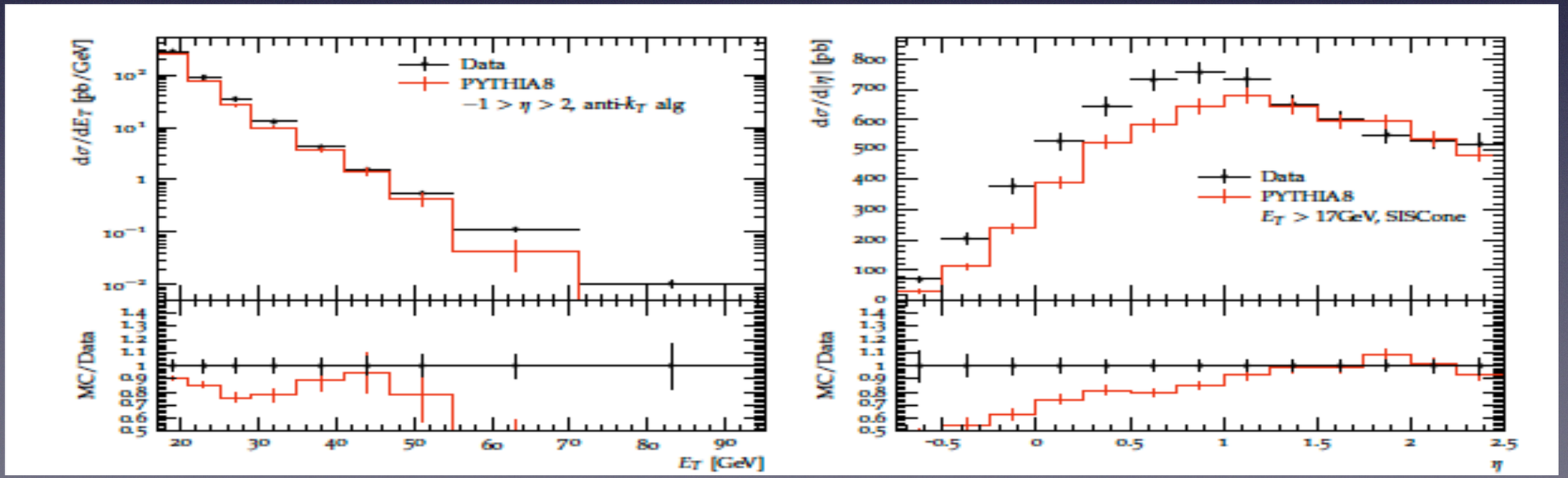


Sherpa

Inclusive jet production

Goa University





Institute (No. of persons)	Interest	Availability	Contact
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IIT Madras (3)	PWG : Inclusive, Jets/HF	1/ 2 years	p.pujahari@gmail.com
Goa University (2)	PWG : Jets/HF, Exclusive/Tagging, Software/Computing	1 / 2 years	prabhakar.palni@cern.ch