In The Dawn of The LHC Era

Tao Han

University of Wisconsin – Madison

LHC Panel Discussion
SUSY 06, UC-Irvine, June 15, 2006

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What am I concerned about ?

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After these long years...

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I Am Ready for The LHC !

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(apart from accelerator and detector issues – lucky theorists)

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Stage I: The "pilot run" with ~ 20 pb^{-1},

Processes	Event rate (20 pb^{-1})
Single jet inclusive ($p_T^j > 100$ GeV)	30M
$J/\psi,\ \Upsilon$	10M
DY $\ell^{\pm}\nu$ (dilepton)	400K (40K)
$t\bar{t}$	18K
$W^+W^-,\ W^{\pm}Z,\ ZZ$	3K
Di-photon $\gamma\gamma$ ($p_T^j > 30$ GeV)	1K

Calibration/Alignment/Reconstruction ...

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Of course, watch out those

a thousand of $V_8 \to jj$ or a few tens of $W', Z' \to \bar{\ell}\ell'$.

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and it increases like $1/\sigma$ or (# of missing particles)$^{-n}$.

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Processes	Event rate (1 fb^{-1})	Accuracy	Implementation
DY $\ell\ell'$ (Z/γ^*, W)	2M, 20M	NNLO	MC@NLO
$gg \to h$ (120 GeV)	30K	NNLO	MC@NLO
Wh, Zh	3K	NNLO	MC@NLO
$b\bar{b} \to h$	700	NNLO	MC@NLO
Di-jets	1.5B	NLO	differential
W^+W^-, $\gamma\gamma$	150K, 50K	NLO	MC@NLO
$WW, ZZ \to h$	5K	NLO	MC@NLO
$t\bar{t}$	0.9M	NLO	MC@NLO
$t\bar{t}h$	700	NLO	differential
Non-resonant signals			
$\tilde{\chi}^+\tilde{\chi}^-, \tilde{t}\bar{\tilde{t}}, \tilde{g}\tilde{g}$ (0.2-1 TeV)	100$-$10,000	NLO	differential
$T\bar{T}$ (1 TeV)	100	NLO	MC@NLO

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Theoretical tools are being further developed...

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  understand backgrounds and detection issues.

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  offering them a beer ...

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- Well, join in the collaboration...

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