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# Comprehensive publication / reference for Glauber/LHC

See <http://inspirehep.net/record/1631672> which includes all parameters and tables for all relevant collision systems.

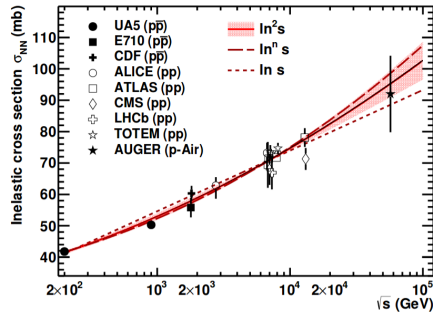


FIG. 1. Inelastic pp cross section as a function of c.m. energy in the range  $\sqrt{s} = 0.2\text{--}100$  TeV. Experimental data points at various colliders and cosmic-ray energies from UA5 [27], E710 [28, 29], CDF [30, 31], ALICE [32], ATLAS [33–36], CMS [37, 38], LHCb [39], TOTEM [40–42] and AUGER [43]. Fits of  $\ln s$ ,  $\ln^2 s$  and  $\ln^3 s$  to the data are shown (for details see text).

$\sqrt{s}$ (TeV)	$\sigma_{\text{NN}}$ (mb)
0.2	41.6 ± 0.6
0.9	52.2 ± 1.0
2.76	61.8 ± 0.9
5.02	67.6 ± 0.6
5.44	68.4 ± 0.5
5.5	68.5 ± 0.5
7	70.9 ± 0.4
8	72.3 ± 0.5
8.16	72.5 ± 0.5
8.8	73.3 ± 0.6
10.6	75.3 ± 0.7
13	77.6 ± 1.0
14	78.4 ± 1.1
17	80.6 ± 1.5
27	86.0 ± 2.4
29	90.5 ± 3.3
63	96.5 ± 4.6
100	102.6 ± 6.0

TABLE II. Values of the nucleon-nucleon inelastic cross section  $\sigma_{\text{NN}}$  extracted from the  $\ln^2 s$  fit, with the uncertainties estimated from the difference of the  $\ln s$  and  $\ln^3 s$  fits ( $\sigma = 2.43$ ) fits at collision-energies  $\sqrt{s}$  relevant for RHIC, LHC, and FCC.

# Parameters for pPb Run 2012 (Not Yet Finalized?)

(Via Email on 7-June-2012 from David d'Enterria : dde@cernNOSPAMPLEASE.ch )

For  $\sqrt{s}=5$  TeV,  $\sigma_{NN} = 70$  (+/- 4) mb (\*). Running the PHENIX Glauber MC with this  $\sigma_{NN}$  get the  $N_{coll}, N_{part}$  values quoted here:

[http://dde.web.cern.ch/dde/glauber\\_lhc.htm](http://dde.web.cern.ch/dde/glauber_lhc.htm)

(\*) this value I get from the COMPETE fit of all PDG data up to Tevatron which is consistent with TOTEM measurements of  $\sigma_{tot,inel}$  at 7 TeV

cheers,

david

# Parameters decided on 10 November 2011 for pPb (was not run in 2011)

(Via Email from David d'Enterria : dde@cernNOSPAMPLEASE.ch )

From my world-data COMPETE-based fits (consistent with the measured 7-TeV data):

```
<I> sigma_tot = 90.8 mb +/- 11 at sqrt(s) = 4400 GeV  
<I> sigma_inel = 68.6 +/- 5.5 mb at sqrt(s) = 4400 GeV  
<I> sigma_el = 22.1 +/- 2.0 mb at sqrt(s) = 4400 GeV  
<I> sigma_diff = 21.9 mb +/- 1.1 at sqrt(s) = 4400 GeV
```

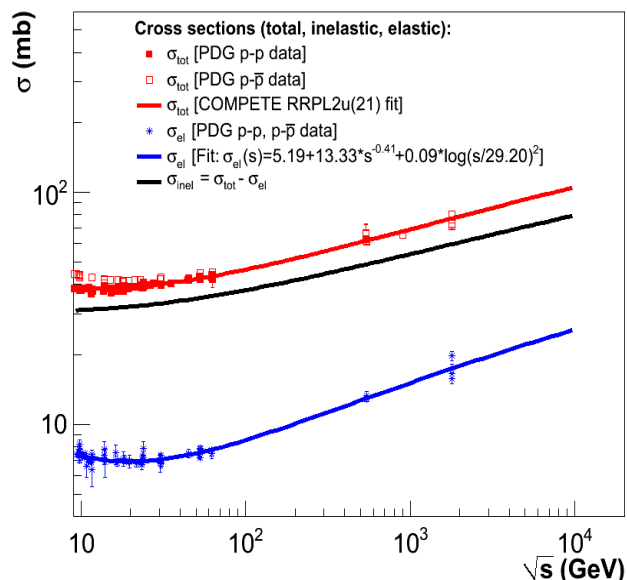
cheers,

david

# Parameters decided on 04 November 2010 for Run

## Parameters for N+N interaction

- Sigma Inelastic NN =  $64 \pm 5$  mb from N+N cross section fits:



from \* glauber\_lhc\_nskin\_5pages.pdf: Draft paper: D. d'Enterria, K Reygers, paper draft to be submitted

## Parameters for Glauber MC

<b>A</b>		208
		Wood Saxon
<b>R</b>	Nuclear Radius	6.62 fm
<b>a</b>	Skin Depth	0.546 fm
<b>d_min</b>	Inter nucleon distance	0.4 fm
<b>w</b>		0 (Spherical)

## Control plots:

Plot/mean/rms of Npart & Ncoll in 5% most central bin in Npart variable.

- Alice
- Atlas
- CMS

## References

- H. De Vries, C. W. De Jager and C. De Vries, Nuclear charge-density-distribution parameters from elastic electron scattering; Atomic Data and Nuclear Tables, Volume 36, Issue 3, May 1987, Pp 495-536
- D. d'Enterria, K Reygers, to be submitted

This topic: Main > LHCglauberBaseline

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