Report of the Editorial Board

On Saturday, July 16th, 2011, to the Open Reading of

the successor of the first W' search paper (online since 6 weeks..)

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Search for high-mass states with one lepton plus missing transverse momentum in proton–proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector ☆

ATLAS Collaboration *

ARTICLE INFO

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ABSTRACT

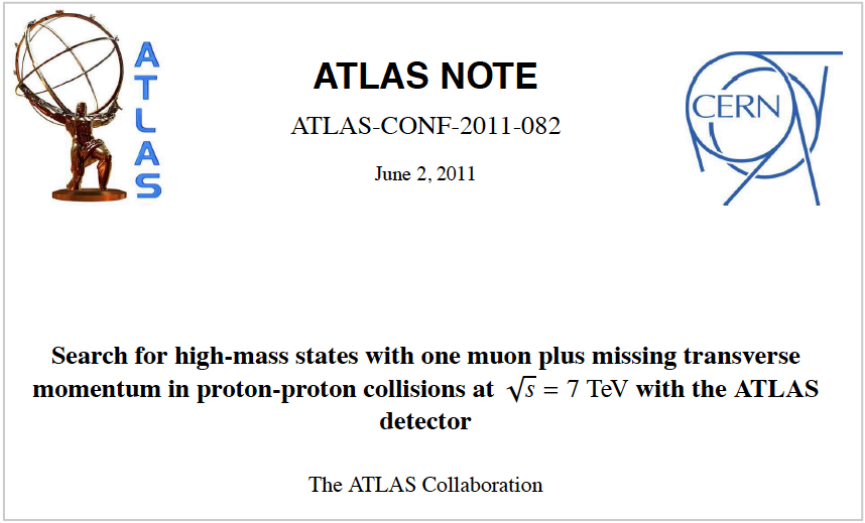
The ATLAS detector is used to search for high-mass states, such as heavy charged gauge bosons (W', W^*), decaying to a charged lepton (electron or muon) and a neutrino. Results are presented based on the analysis of pp collisions at a center-of-mass energy of 7 TeV corresponding to an integrated luminosity of 36 pb^{-1}. No excess beyond standard model expectations is observed. A W' with sequential standard model couplings is excluded at 95% confidence level for masses below 1.49 TeV, and a W^* (charged chiral boson) for masses below 1.35 TeV.

Corrinne Mills, Thomas Koffas, Ludovico Pontecorvo, Max Klein

"Thank you very much for becoming the W? edboard chair" (Cigdem 28.4.11) – there was first no Edboard anymore but thanks to Corinne, Ludo, Thomas there is..

PLHC

205 pb^{-1} W → μν ✣ 2010 (e+μ)



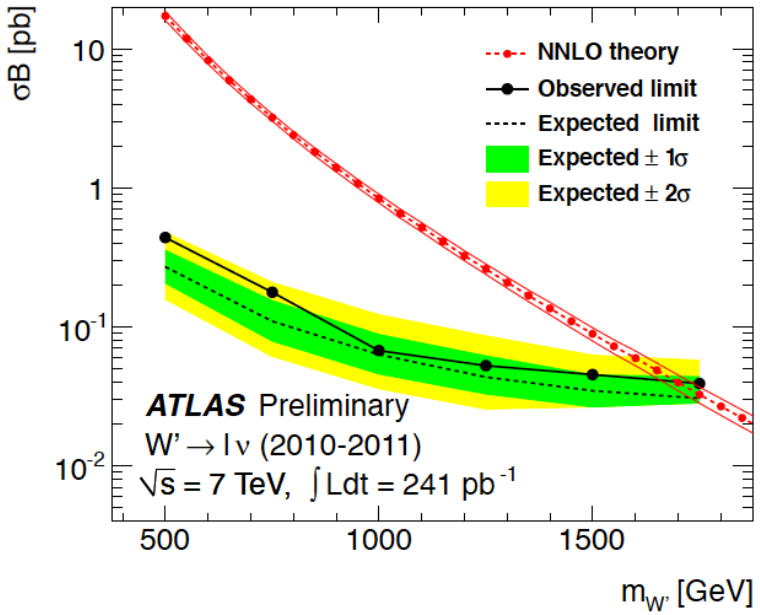
ATLAS NOTE

ATLAS-CONF-2011-082

June 2, 2011

Search for high-mass states with one muon plus missing transverse momentum in proton-proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector

The ATLAS Collaboration



New since PLHC:

Full statistics [1.04 fb^{-1}]
Electron channel included

Higher order corrections
Looser 2nd muon veto
Optimised mass cuts
Math. Test for deviation from SM
CLS → Bayesian

→ 8. July: Paper Draft: ATLAS-EXOT-2011-05-001

New during this week:

Cut on absolute MS-ID parameter $S_{q/p}$
Latest luminosity uncertainty (3.4 → 3.7)
More accurate NNLO signal efficiency
Consolidated statement on other priors

[very small effects, mass limits as before]

Reaction to comments

Paper Draft

ATLAS-EXOT-2011-05-001

Search for a heavy gauge boson decaying to a charged lepton and a neutrino in 1 fb^{-1} of pp collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector

The ATLAS Collaboration

~3000 authors, 9 pages, 6 tables, 3 figures (letter – follow up Physics Letters?)

Supporting internal note

Search for high-mass states with one lepton plus missing transverse momentum using the ATLAS detector with 1 fb^{-1} of 2011 pp collisions at $\sqrt{s} = 7\ TeV$

http://cdsweb.cern.ch/record/1361980

30 authors, 83 pages, 52 tables, 37 figures

Two event displays of the highest mT muon (PLHC) and electron event (new)

Status 15.7. 11am

Comments received

Very nice results. | Minor comments only - nice draft | the paper is very well written, and an excellent and timely result…

- interest in limits below 500GeV: could be of interest too, have no xsections, D0/CDF start at 500 too, next paper.?

- note on W' → WH decay: the limit is within the SSM model and thus one may not discuss WH nor Wy etc.

- use of FEWZ (σ) and ZWPROD (mT shape): convenient [btw sth similar happens in WZ with FEWZ2 and DYNNLO]

- *** FEWZ for kinematical distributions (l 320) Victoria: David/Serhan

- ***"extended gauge model" of [5] answer to Georges Azuelos

- some alignment with Z' paper *** Henri's remarks on approximate NNLO and dE

- more will come today …

-Text adapted top suggestions from ATLAS colleagues

Fig 3 Question

"It has a very short shelf life" TL

2010 paper

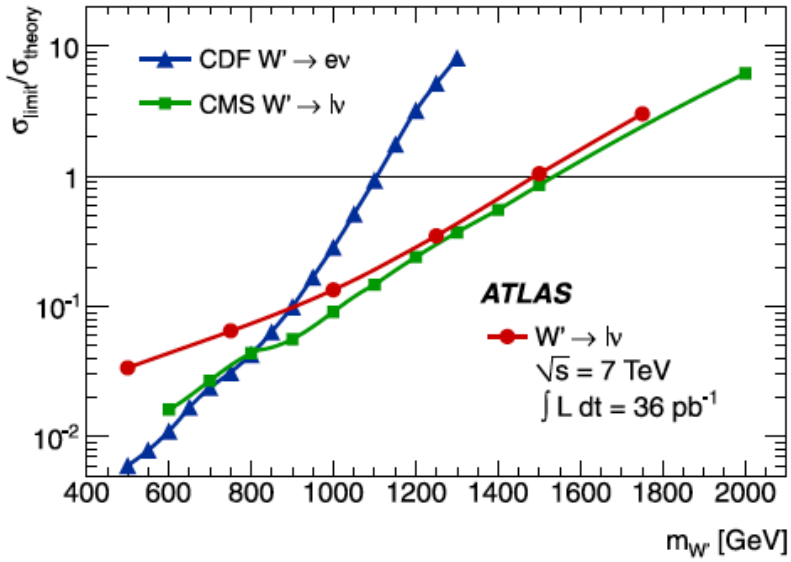
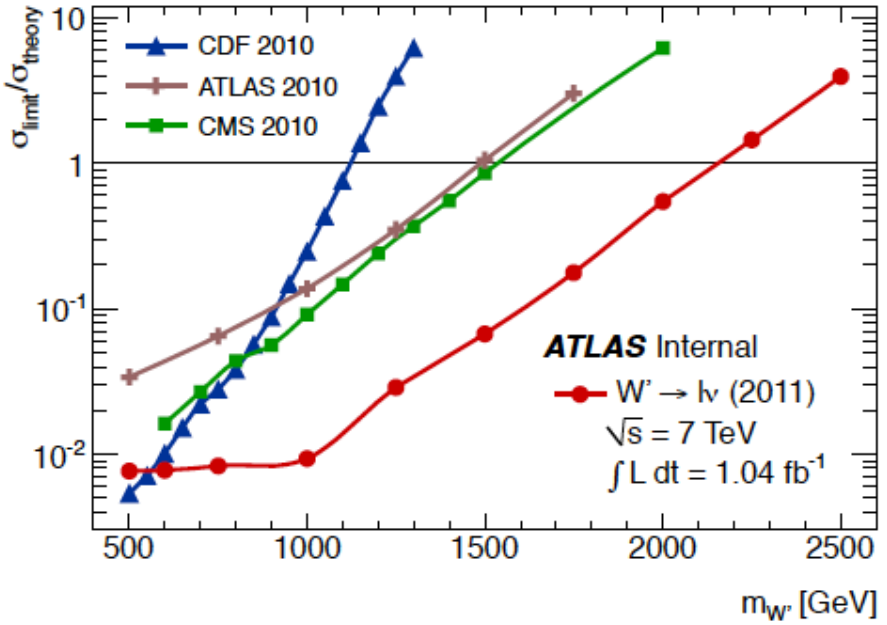


Fig. 5. Normalized cross-section limits ($\sigma_{limit}/\sigma_{theory}$) for W' as a function of mass for this measurement and those from CDF and CMS. The cross-section calculations assume the W' has the same couplings as the standard model W boson. The region above each curve is excluded at 95% CL.

Fig.3 in 2011 draft



This figure is a summary of the status of the SSM W' limits.

If by the time we publish there is a citable CMS 2011 result it will be included.

Support the author's view that the figure, as in 2010, is of interest to be included in the paper to demonstrate the world context of SSM W' searches.

Recommendation

The Edboard, following the work of the 2010 Edboard, has accompanied this paper through PLHC 11 to now. The analysis has evolved but stayed close to the previous publication. The authors have dealt with all comments received. A very final reading by us of the paper draft is imminent (as the commenting period ended on Friday 15.7.). There is no doubt that there is no W' below 1 TeV and as the analysis shows, there is none within the SSM below 2.1 TeV. The Edboard recommends sending the results to EPS and proceeding with the paper publication as if there was no conference ahead.

The Edboard congratulates the authors to this achievement and wishes to thank David Adams, Alaettin Serhan Mete and colleagues and the exotics convenors, Cigdem Issever and Henri Bachacou for a very interesting and fruitful collaboration

Report