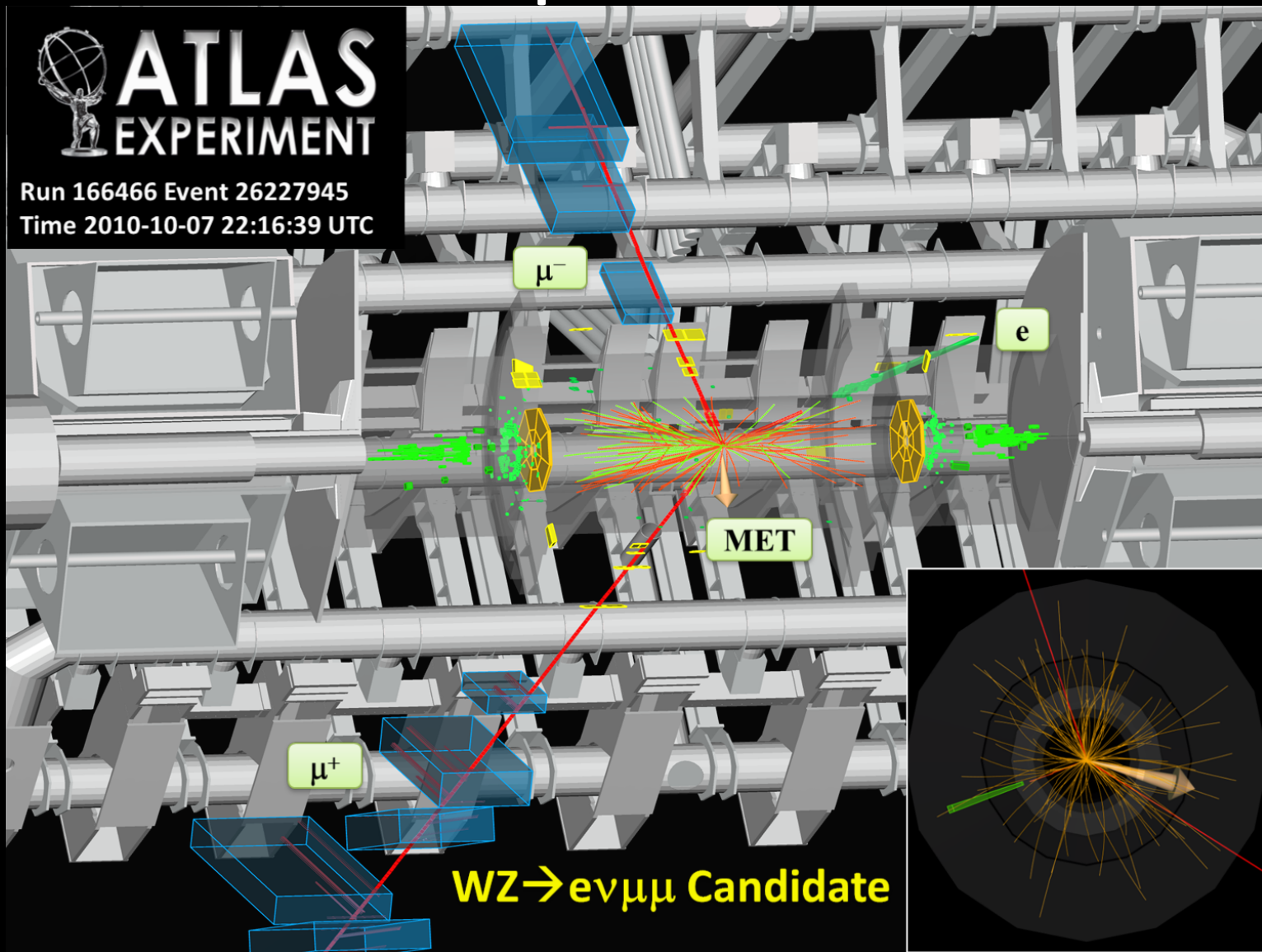


ATLAS Report CDS 2012



Edoardo Gorini

On behalf of the ATLAS Lecce Group

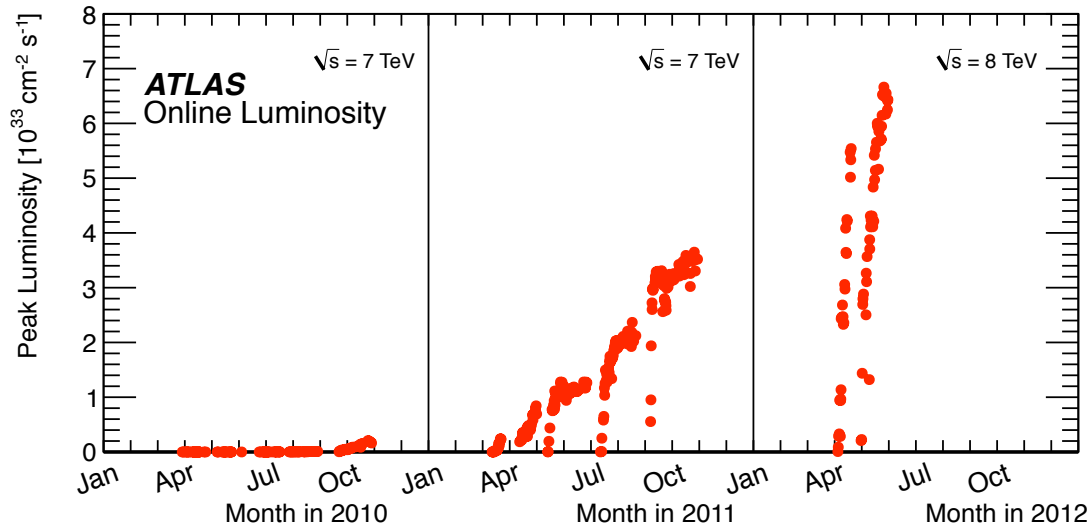
(M.Bianco, G.Chiodini, E.M.V.Fasanelli, P.Fiore, E.Gorini, A.Innocente, L.Longo, A.Miccoli, N.Orlando, M.Primavera, M.Reale, S.Spagnolo, A.Ventura)

Outline

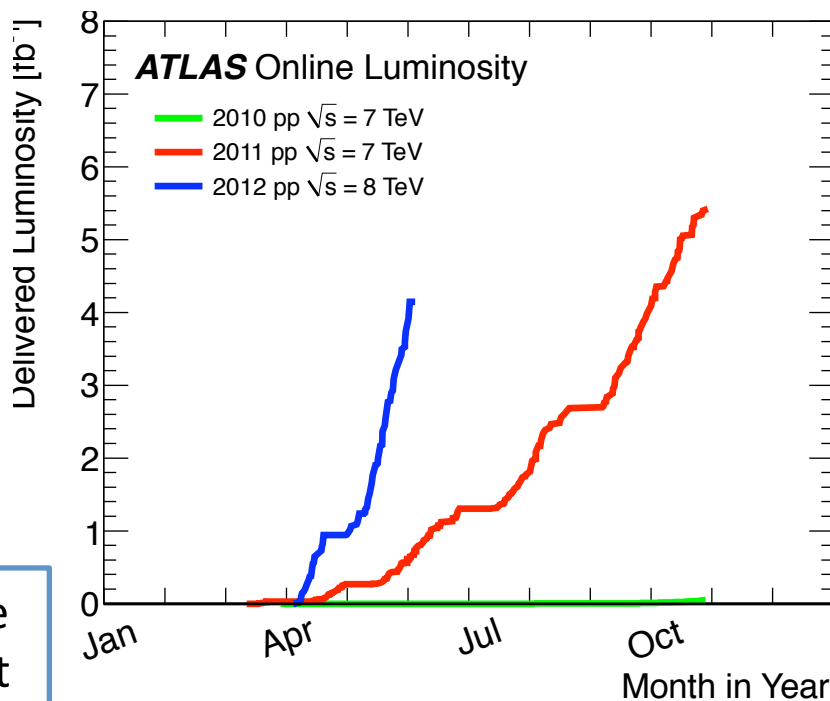
- LHC
- ATLAS
 - Data Taking
 - Performances
 - Physics Highlights
 - Muon Upgrade
- Lecce Contributions and Activities

LHC

LHC Performance

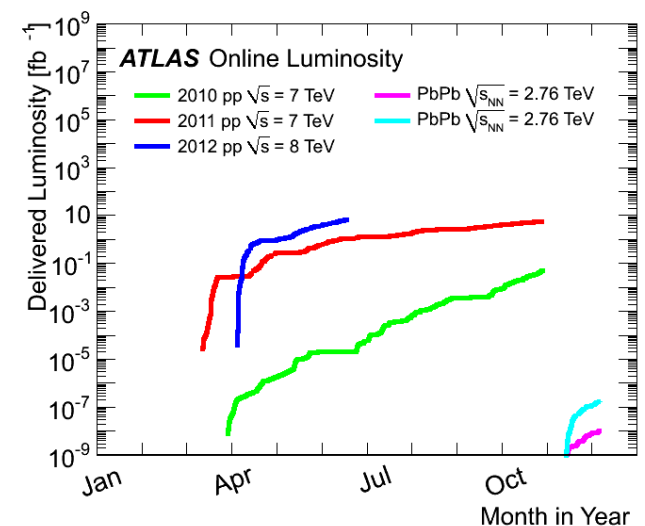


Very rapid
rise in
luminosity

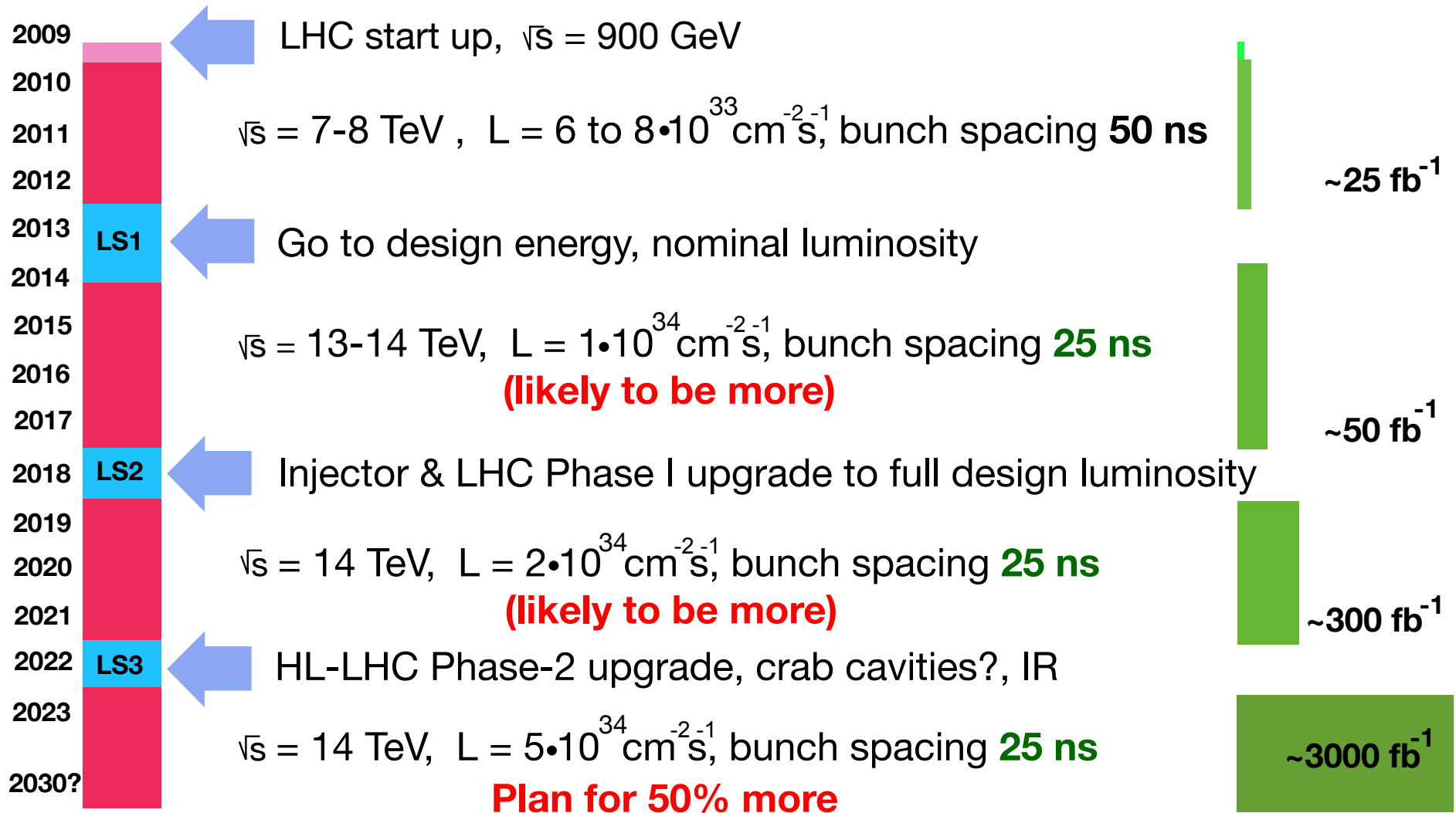


Hope to be
off the plot
soon

Good machine stability
leads to high integrated
luminosity



LHC plans (LS1, LS2, LS3)



ATLAS

ATLAS Detector

Inner Detector: $|\eta| < 2.5$

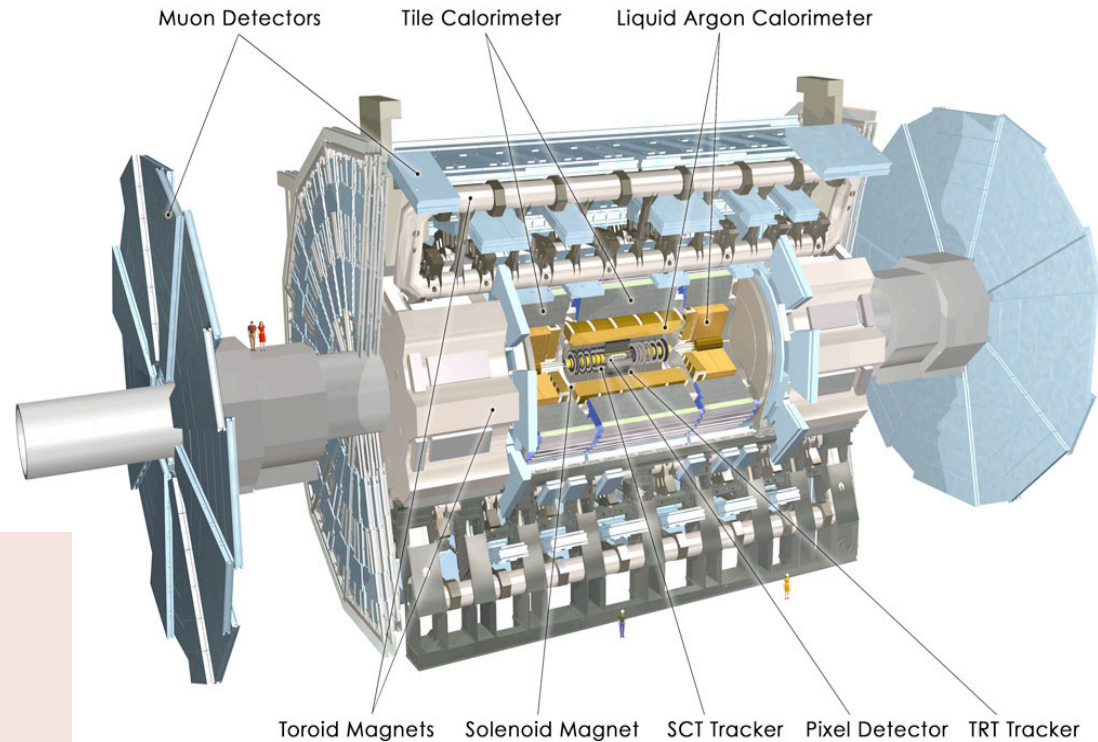
- Si Pixels: $40 \times 800 \mu\text{m}$
- Si Strips: $80 \mu\text{m}$
- Transition Rad. Tracker
- Solenoid: $B = 2 \text{ T}$

Calorimeters: $|\eta| < 4.9$

- Lead/LAr : Electromagnetic
- Cu/LAr : Hadronic Endcap
- Tile (steel/plastic scintillator):
Hadronic Barrel

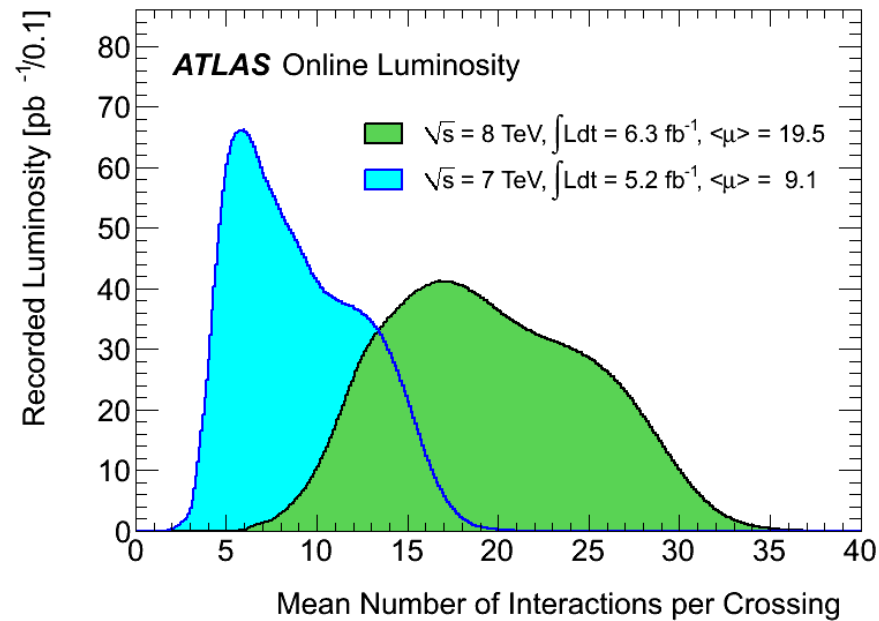
Muon System: $|\eta| < 2.5$

- Trigger chambers (RPC and TGC)
- Precision chambers (MDT and CSC)
- Air-core toroid magnet ($\int B dL = 1\text{-}7.5 \text{ Tm}$)

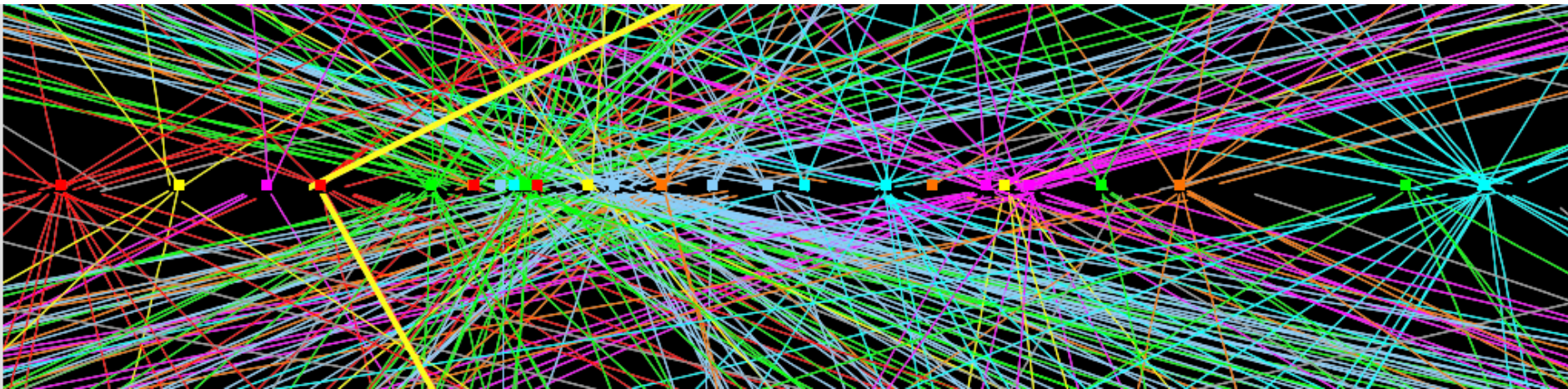


- **Several forward detectors**
 - LUCID, MBTS, ZDC
 - Luminosity measurement and forward physics

Detector Operations



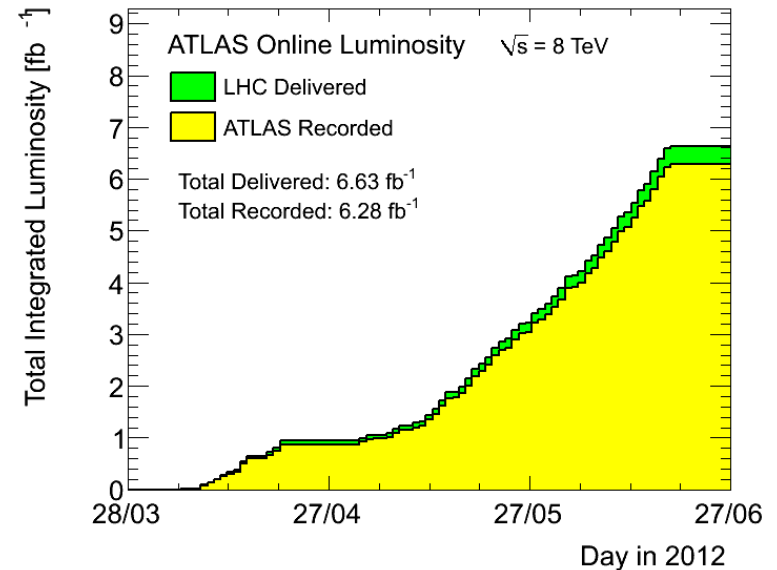
2012 pileup event



ATLAS definition of μ based on $\sigma_{\text{inelastic}}$

2012 Luminosity and Data Taking

- Max Inst Lum.: $7 \cdot 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$
- ATLAS is recording the amazing amount of LHC data efficiently: **6.28 fb^{-1} on tape !**
For 2012 at June 18th
 - 94.6% data-taking efficiency
 - Uncertainty on luminosity: going down to 1.2 % !
- Very High Quality of data

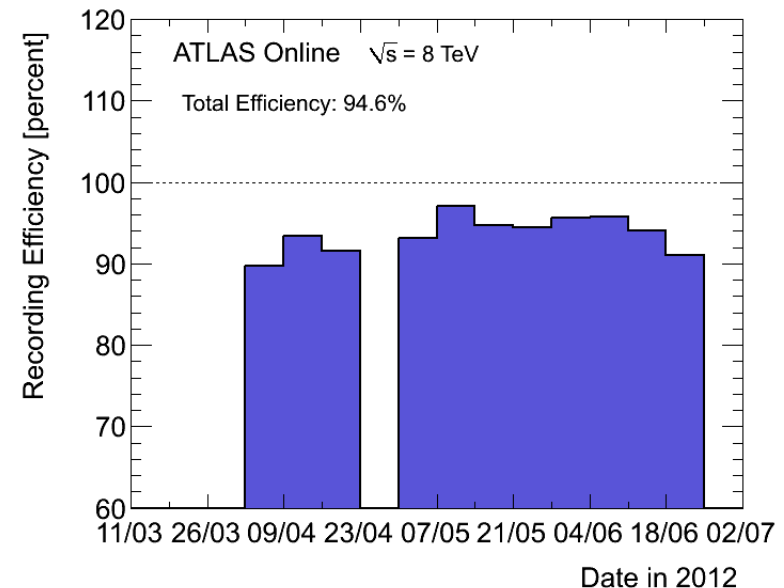


ATLAS 2011 p-p run												
Inner Tracking			Calorimeters				Muon Detectors				Magnets	
Pixel	SCT	TRT	LAr EM	LAr HAD	LAr FWD	Tile	MDT	RPC	CSC	TGC	Solenoid	Toroid
99.8	99.6	99.2	97.5	99.2	99.5	99.2	99.4	98.8	99.4	99.1	99.8	99.3

Luminosity weighted relative detector uptime and good quality data delivery during 2011 stable beams in pp collisions at $\sqrt{s}=7 \text{ TeV}$ between March 13th and October 30th (in %), after the summer 2011 reprocessing campaign

ATLAS 2012 p-p run											
Inner Tracker			Calorimeters		Muon Spectrometer				Magnets		
Pixel	SCT	TRT	LAr	Tile	MDT	RPC	CSC	TGC	Solenoid	Toroid	
100	99.4	100	95.0	98.7	100	99.2	100	99.9	100	100	

Luminosity weighted relative detector uptime and good quality data delivery during 2012 stable beams in pp collisions at $\sqrt{s}=8 \text{ TeV}$ between April 4th and May 31st (in %) – corresponding to 3.5 fb^{-1} of recorded data. The inefficiencies in the LAr calorimeter will partially be recovered in the future.



Muon Upgrade

Background for 20 GeV
muons all in endcap

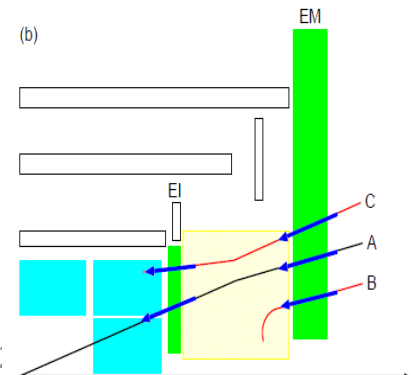
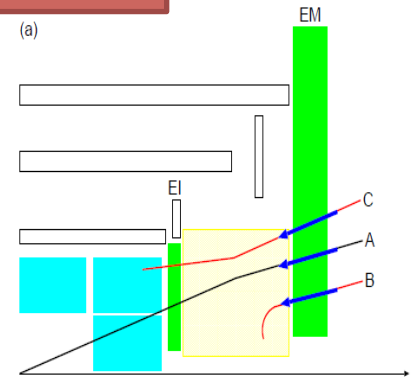
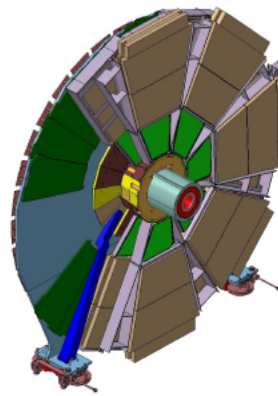
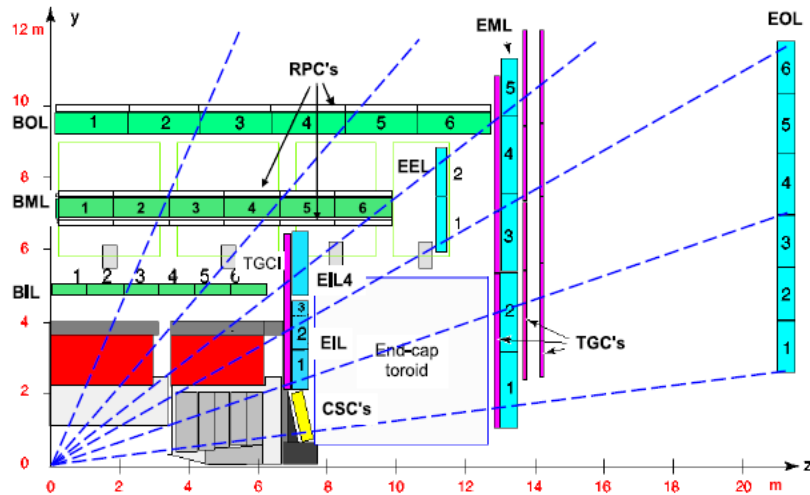
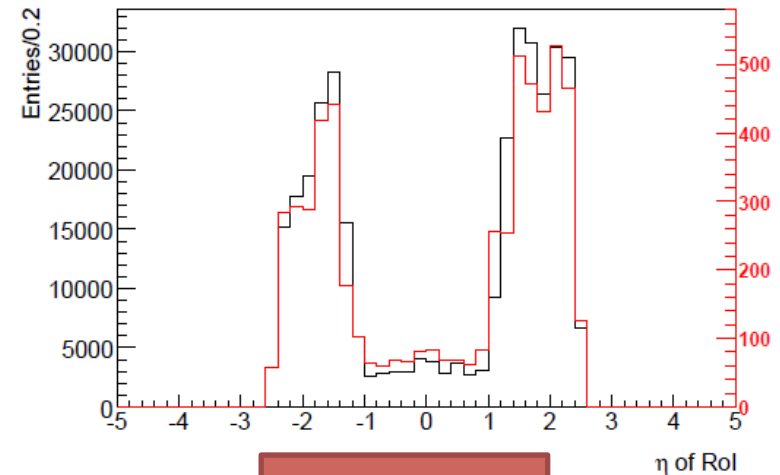


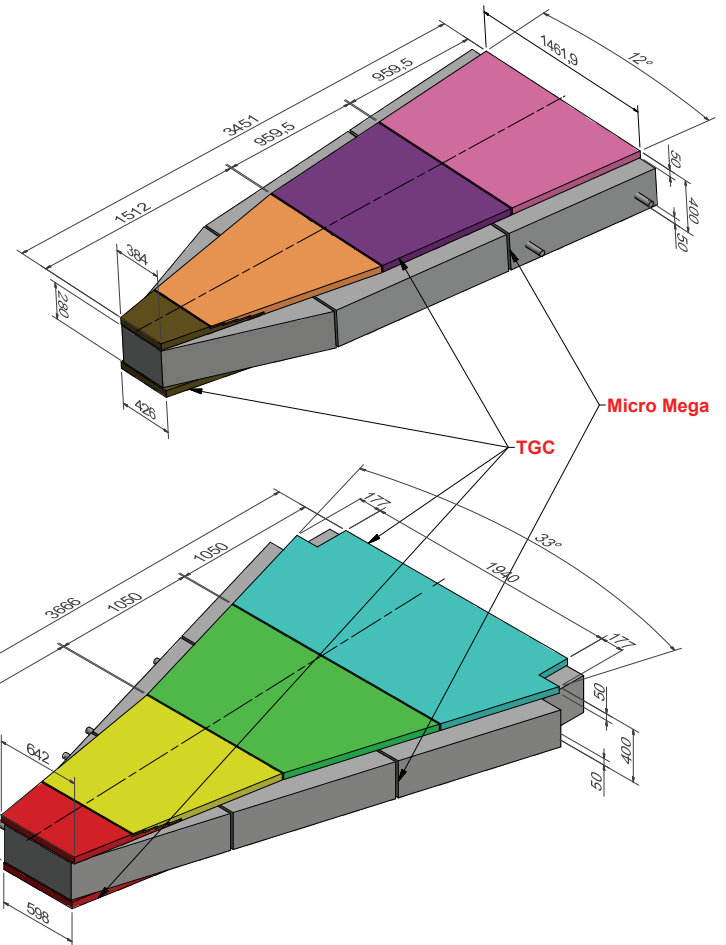
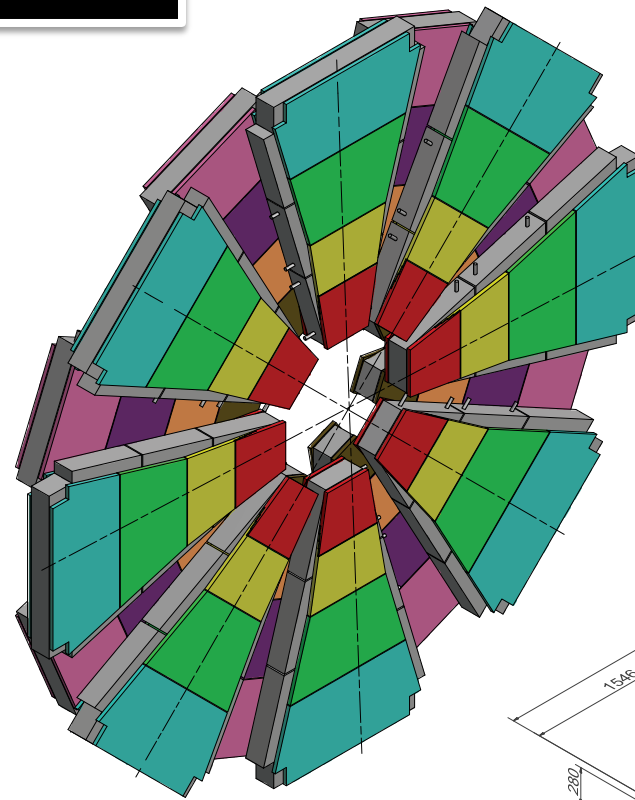
Figure 2.1. Left: A z-y view of 1/4 of the ATLAS detector. The blue boxes indicate the end-cap MDT chambers and the yellow box CSC. Right: A view of a small wheel mounted on the JD disk shielding.

- Provide IP pointing segment in EI (small wheel) for triggering
- Improve P_t trigger resolution in Phase 2
- Provide precision tracking that works up to the ultimate luminosity $5-7 \times 10^{34}$, with some safety margin

4 June

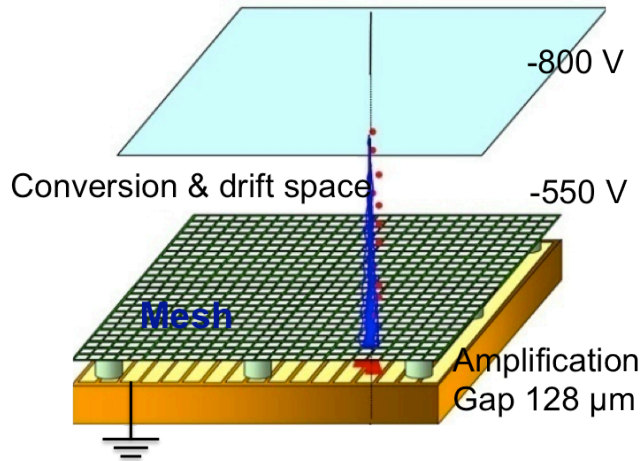
New Small Wheel (NSW)

- 16 sectors per wheel
- 2 sTGC-MM multilayers per sector
- Each multilayer: 4 sTGC and 4 MicroMegas planes



TGC with MM on Small Wheel		תכנון מכשירים	Updated by	Date
		Instrument Design	Benny	21/05/2012
Ordered By		Particle Physics	Designed by	Date
		4730.00- Sectors	Benny	24/04/2012
Project	Part	Part Name	Material	Quantity

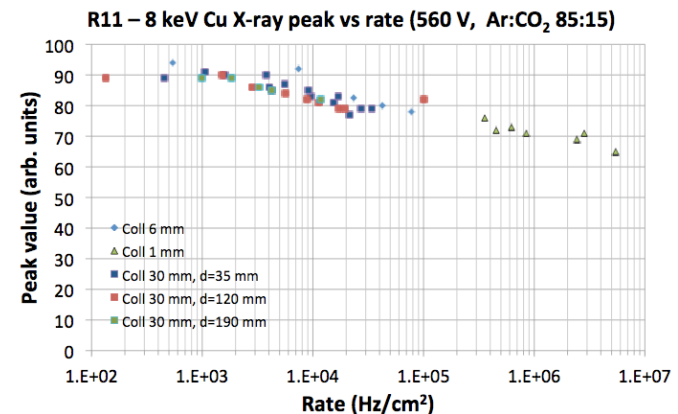
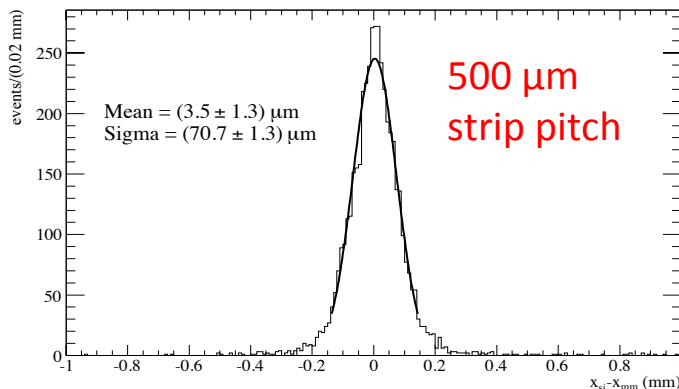
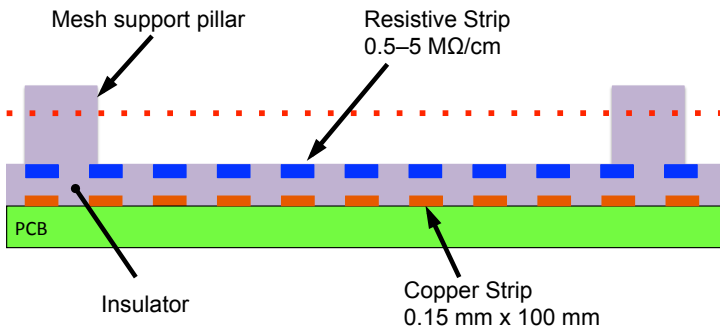
MicroMegas



- High rate tolerance
- good spatial resolution
- good two track separation

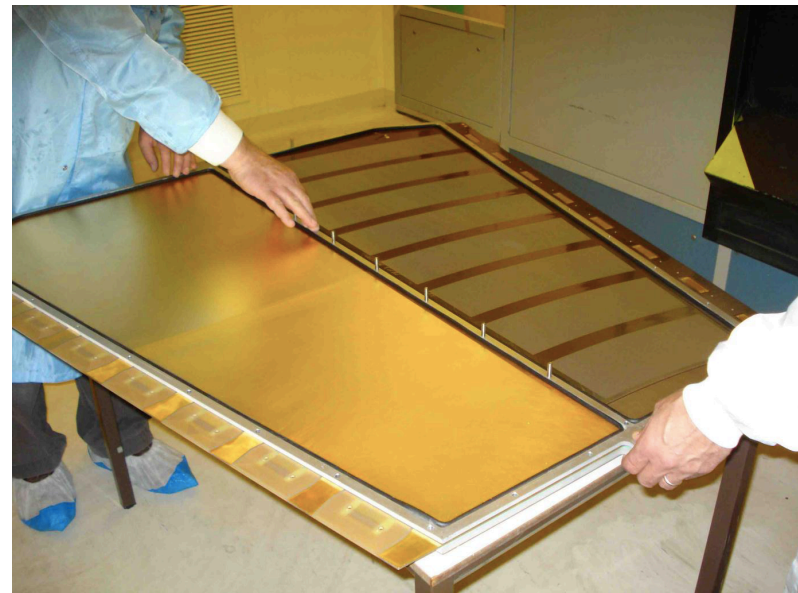
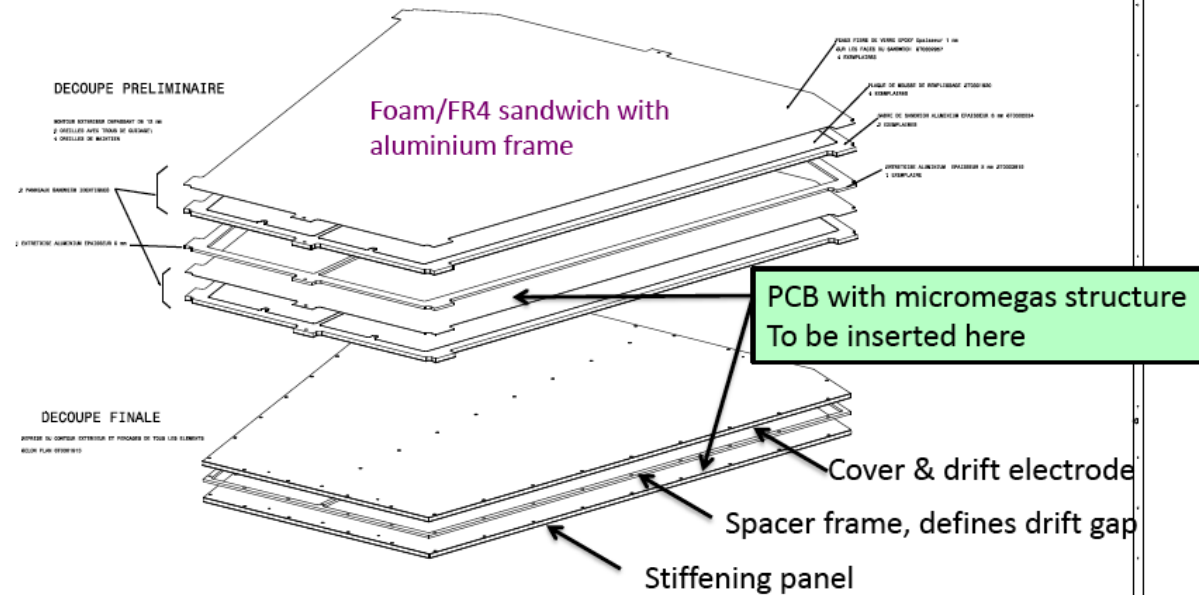
- resistive strips (ATLAS innovation) to avoid sparks
- bulk technology (PCB) -> large surface detectors

- track vector reconstruction (μ TPC)
- simple concept of L1 trigger segment, complementary to TGC
- sensitivity to cavern background :
~ 1/3 of MDT



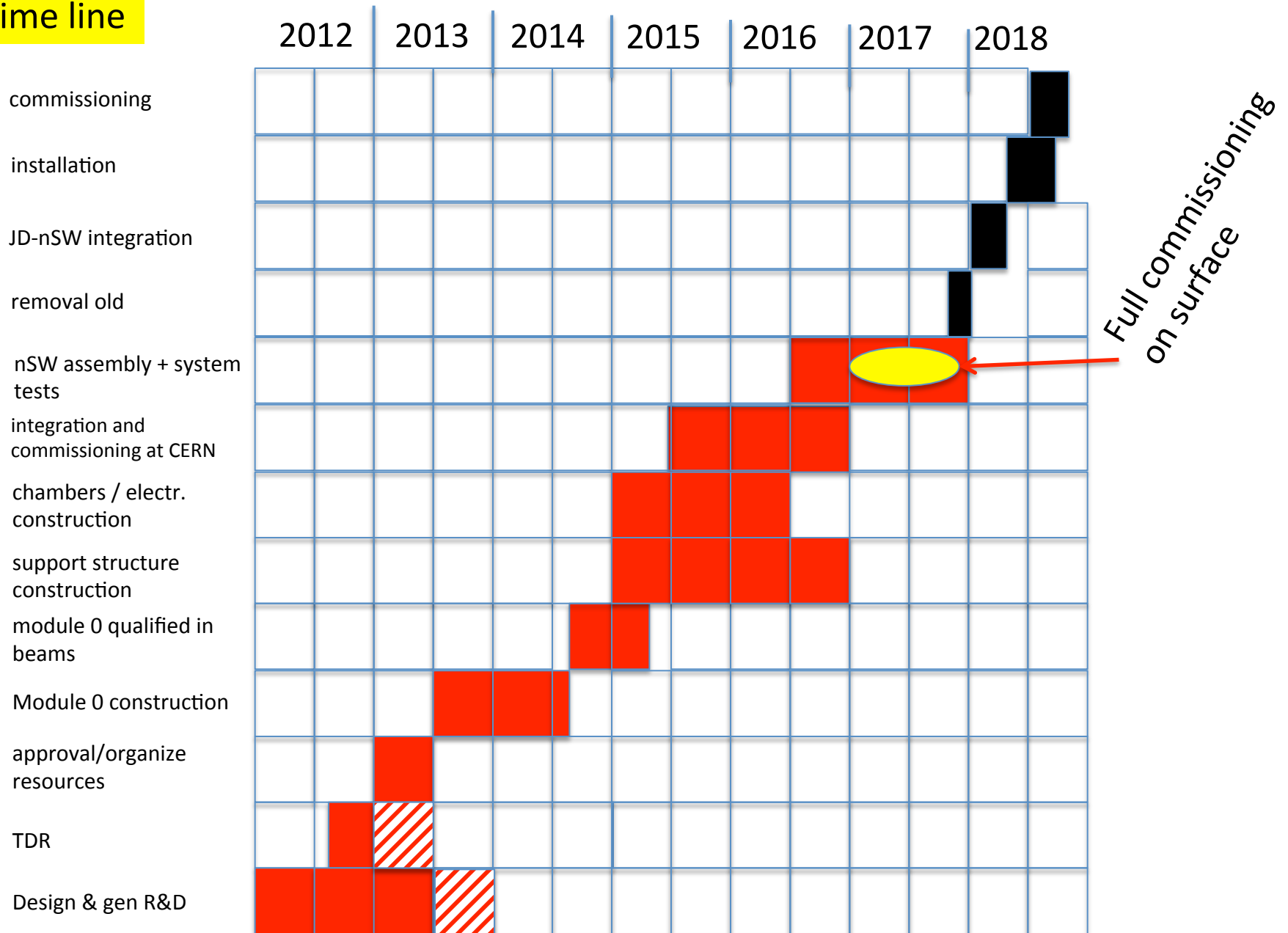
MicroMegas Basic Numbers

- Total number of MM planes: 1024
- Total number of chambers: 128
- Read-out:
 - 2 Coordinates per plane **~2 M channels**
 - 0.5 mm strips



Timeline

Time line



PHYSICS RESULTS HIGHLIGHTS

Publications

Web of Science®

Results Author(s) (atlas collaboration)
Timespan=2011-2012; Databases=SCI-EXPANDED;
Lemmatization=On

Results **155**

Page 1 of 16 Go

Refine Results

Search within results for

Search

Web of Science Categories

Refine

- ☐ PHYSICS MULTIDISCIPLINARY (79)
- ☐ PHYSICS PARTICLES FIELDS (58)
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- ☐ ASTRONOMY ASTROPHYSICS (18)
- ☐ PHYSICS NUCLEAR (14)

more options / values...

Document Types

Refine

- ☐ ARTICLE (154)
- ☐ PROCEEDINGS PAPER (25)
- ☐ CORRECTION (1)

more options / values...

Subject Areas

Authors

Group Authors

Editors

Source Titles

Book Series Titles

Publication Years

Institutions

Funding Agencies

Languages

Countries/Territories

For advanced refine options, use

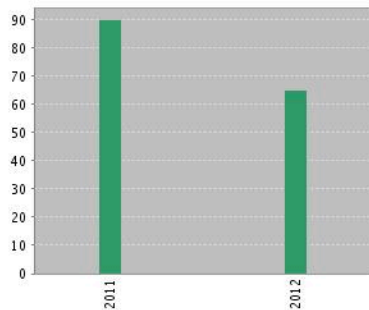
Analyze Results

Save to: ENDNOTE® WEB ENDNOTE® ResearcherID more options

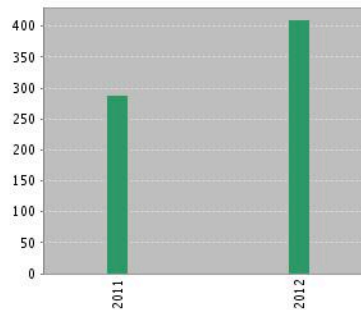
- Title: **Search for heavy vector-like quarks coupling to light quarks in proton-proton collisions at root s=7 TeV with the ATLAS detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICS LETTERS B Volume: 712 Issue: 1-2 Pages: 22-39 DOI: 10.1016/j.physletb.2012.03.082 Published: MAY 30 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Search for contact interactions in dilepton events from pp collisions at root s=7 TeV with the ATLAS detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICS LETTERS B Volume: 712 Issue: 1-2 Pages: 40-58 DOI: 10.1016/j.physletb.2012.04.026 Published: MAY 30 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Observation of Spin Correlation in tt-bar Events from pp Collisions at root s=7 TeV Using the ATLAS Detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICAL REVIEW LETTERS Volume: 108 Issue: 21 Article Number: 212001 DOI: 10.1103/PhysRevLett.108.212001 Published: MAY 24 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Measurement of the production cross section of an isolated photon associated with jets in proton-proton collisions at root s=7 TeV with the ATLAS detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICAL REVIEW D Volume: 85 Issue: 9 Article Number: 092014 DOI: 10.1103/PhysRevD.85.092014 Published: MAY 23 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Search for first generation scalar leptoquarks in pp collisions at root s = 7 TeV with the ATLAS detector (vol 709, pg 158, 2012)**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICS LETTERS B Volume: 711 Issue: 5 Pages: 442-455 DOI: 10.1016/j.physletb.2012.03.023 Published: MAY 23 2012
Times Cited: 0 (from Web of Science)
[Full Text](#)
- Title: **Search for Production of Resonant States in the Photon-Jet Mass Distribution Using pp Collisions at root s=7 TeV Collected by the ATLAS Detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICAL REVIEW LETTERS Volume: 108 Issue: 21 Article Number: 211802 DOI: 10.1103/PhysRevLett.108.211802 Published: MAY 22 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Measurement of the top quark pair production cross-section with ATLAS in the single lepton channel**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICS LETTERS B Volume: 711 Issue: 3-4 Pages: 244-263 DOI: 10.1016/j.physletb.2012.03.083 Published: MAY 15 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Study of jets produced in association with a W boson in pp collisions at root s=7 TeV with the ATLAS detector**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICAL REVIEW D Volume: 85 Issue: 9 Article Number: 092002 DOI: 10.1103/PhysRevD.85.092002 Published: MAY 2 2012
Times Cited: 0 (from Web of Science)
[Full Text](#) [View abstract](#)
- Title: **Search for Scalar Bottom Quark Pair Production with the ATLAS Detector in pp Collisions at root s=7 TeV**
Author(s): Aad G.; Abbott B.; Abdallah J.; et al.
Group Author(s): **ATLAS Collaboration**
Source: PHYSICAL REVIEW LETTERS Volume: 108 Issue: 18 Article Number: 181802 DOI: 10.1103/PhysRevLett.108.181802 Published: MAY 2 2012
Times Cited: 0 (from Web of Science)

Citations

Published Items in Each Year



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Results found:	155
Sum of the Times Cited [?]:	698
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Average Citations per Item [?]:	4.50
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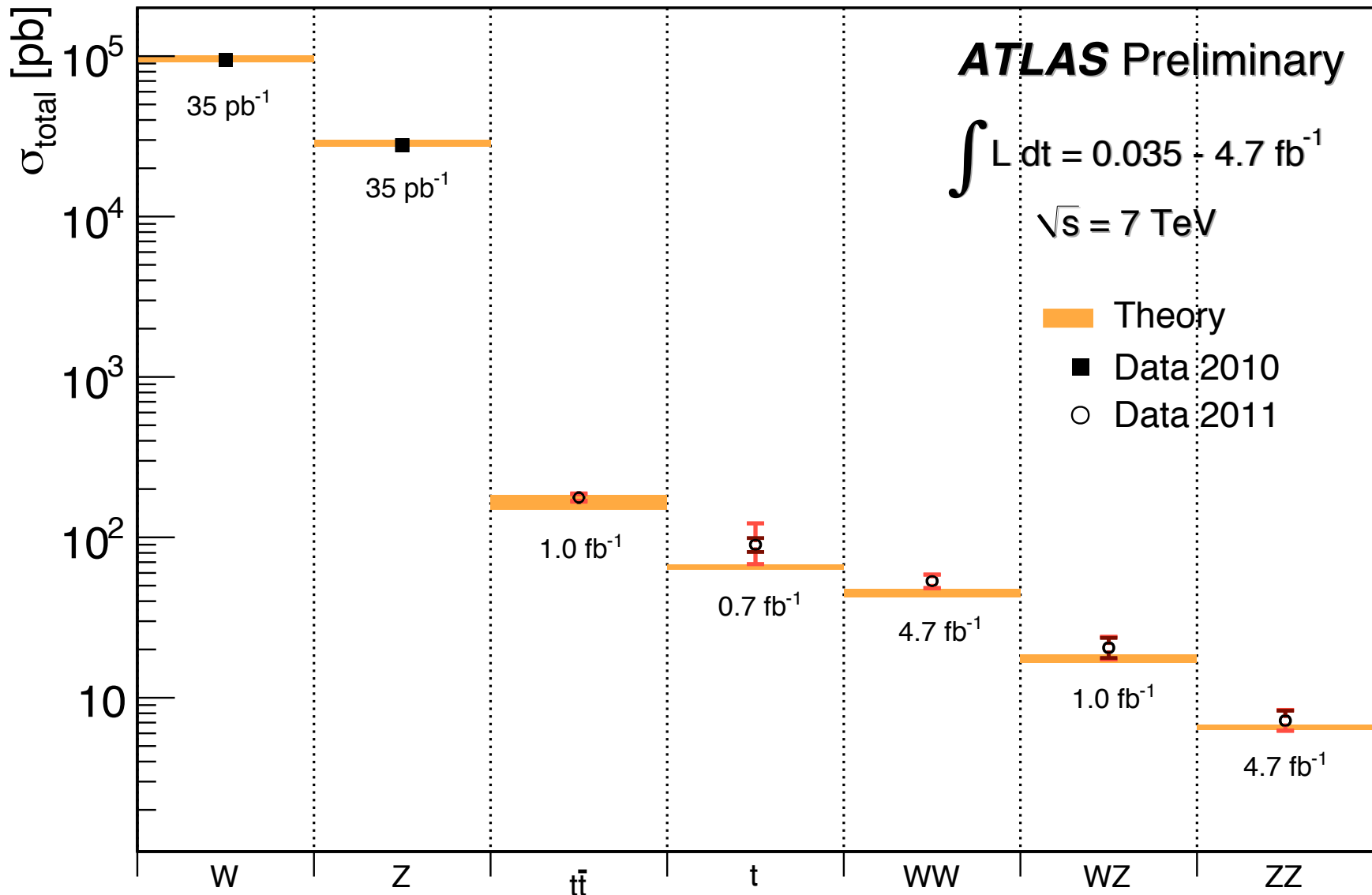
Results: 155

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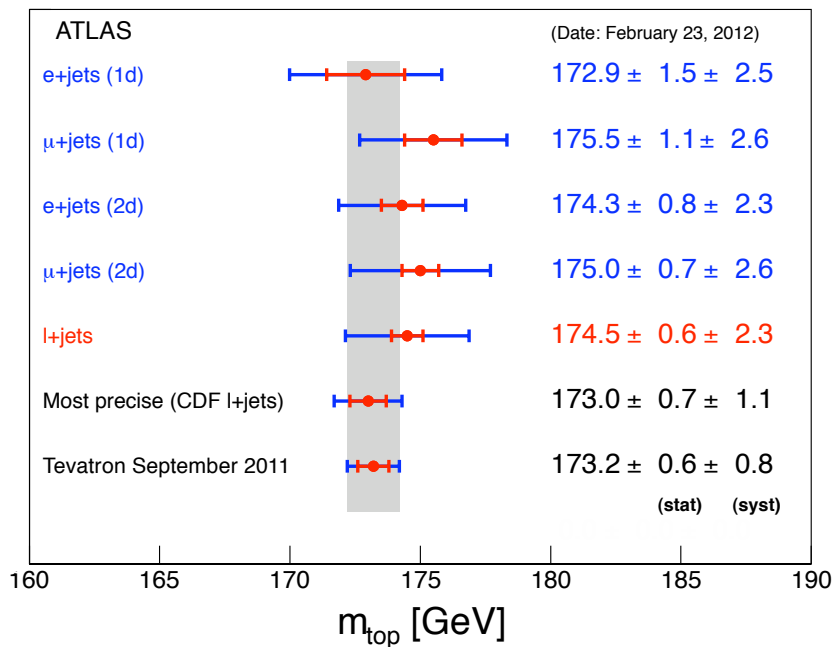
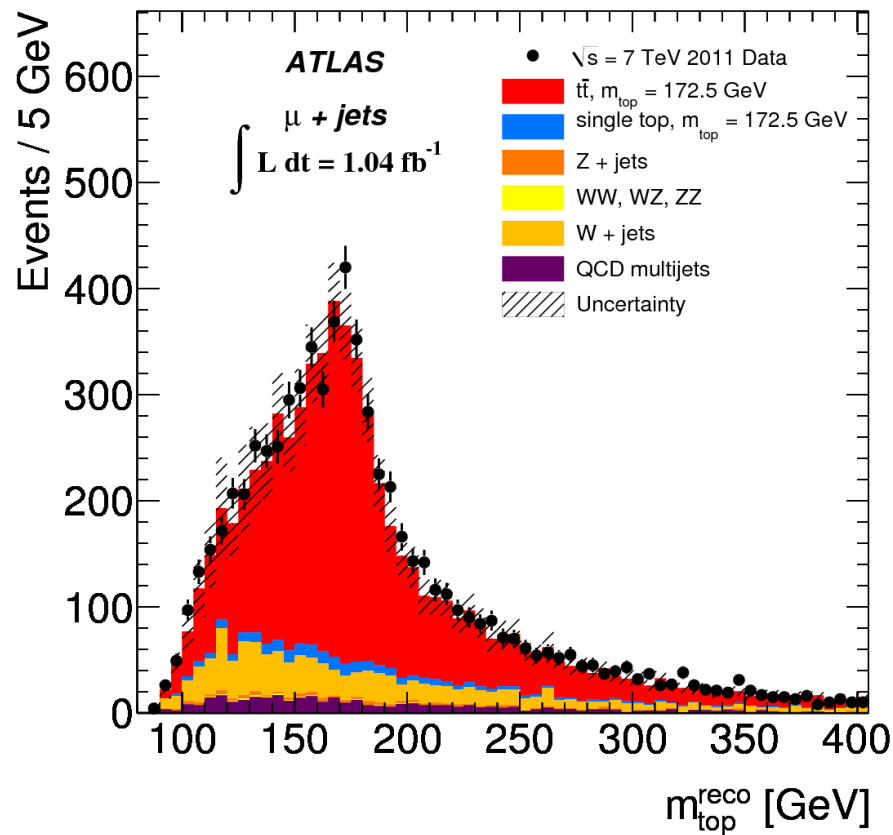
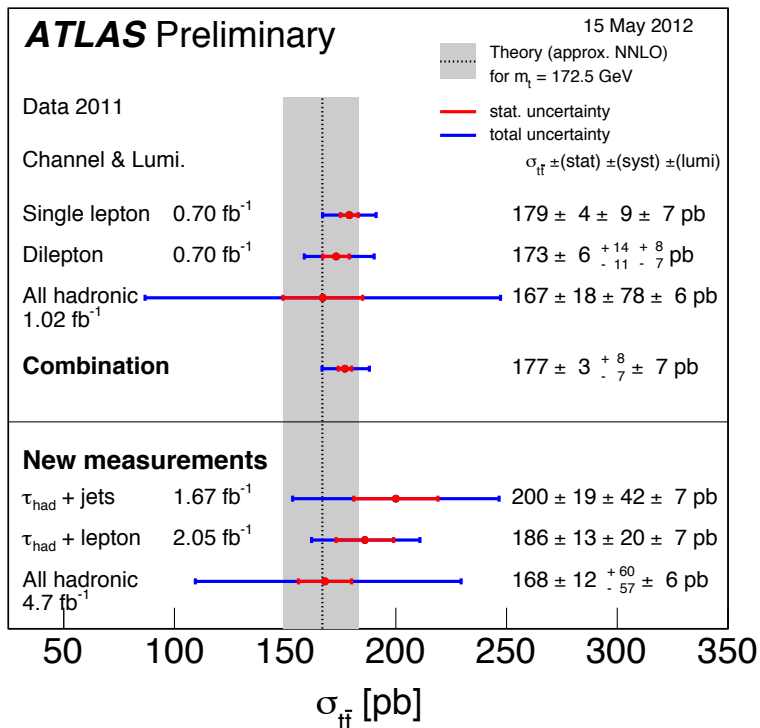
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		2011	2012	Total
Use the checkboxes to remove individual items from this Citation Report or restrict to items published between 2011 and 2012 Go		288	410	698
☐	1. Title: Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS detector in root s=7 TeV proton-proton collisions Author(s): Aad G.; Abdallah J.; Abdelalim A. A.; et al. Group Author(s): ATLAS Collaboration Source: PHYSICS LETTERS B Volume: 701 Issue: 2 Pages: 186-203 DOI: 10.1016/j.physletb.2011.05.061 Published: JUL 4 2011	31	31	62
☐	2. Title: Search for Supersymmetry Using Final States with One Lepton, Jets, and Missing Transverse Momentum with the ATLAS Detector in root s=7 TeV pp Collisions Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: PHYSICAL REVIEW LETTERS Volume: 106 Issue: 13 Article Number: 131802 DOI: 10.1103/PhysRevLett.106.131802 Published: MAR 28 2011	41	20	61
☐	3. Title: A search for new physics in dijet mass and angular distributions in pp collisions at root s=7 TeV measured with the ATLAS detector Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: NEW JOURNAL OF PHYSICS Volume: 13 Article Number: 053044 DOI: 10.1088/1367-2630/13/5/053044 Published: MAY 24 2011	22	16	38
☐	4. Title: Search for supersymmetry in pp collisions at root s=7 TeV in final states with missing transverse momentum and b-jets Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: PHYSICS LETTERS B Volume: 701 Issue: 4 Pages: 398-416 DOI: 10.1016/j.physletb.2011.06.015 Published: JUL 18 2011	8	18	26
☐	5. Title: Search for quark contact interactions in dijet angular distributions in pp collisions at root s=7 TeV measured with the ATLAS detector Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: PHYSICS LETTERS B Volume: 694 Issue: 4-5 Pages: 327-345 DOI: 10.1016/j.physletb.2010.10.021 Published: JAN 3 2011	19	6	25
☐	6. Title: Measurement of the centrality dependence of J/psi yields and observation of Z production in lead-lead collisions with the ATLAS detector at the LHC Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: PHYSICS LETTERS B Volume: 697 Issue: 4 Pages: 294-312 DOI: 10.1016/j.physletb.2011.02.006 Published: MAR 14 2011	11	12	23
☐	7. Title: Search for supersymmetric particles in events with lepton pairs and large missing transverse momentum in root s=7 TeV proton-proton collisions with the ATLAS experiment Author(s): Aad G.; Abbott B.; Abdallah J.; et al. Group Author(s): ATLAS Collaboration Source: EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 7 Article Number: 1682 DOI: 10.1140/epjc/s10052-011-1682-6 Published: JUL 2011	5	16	21

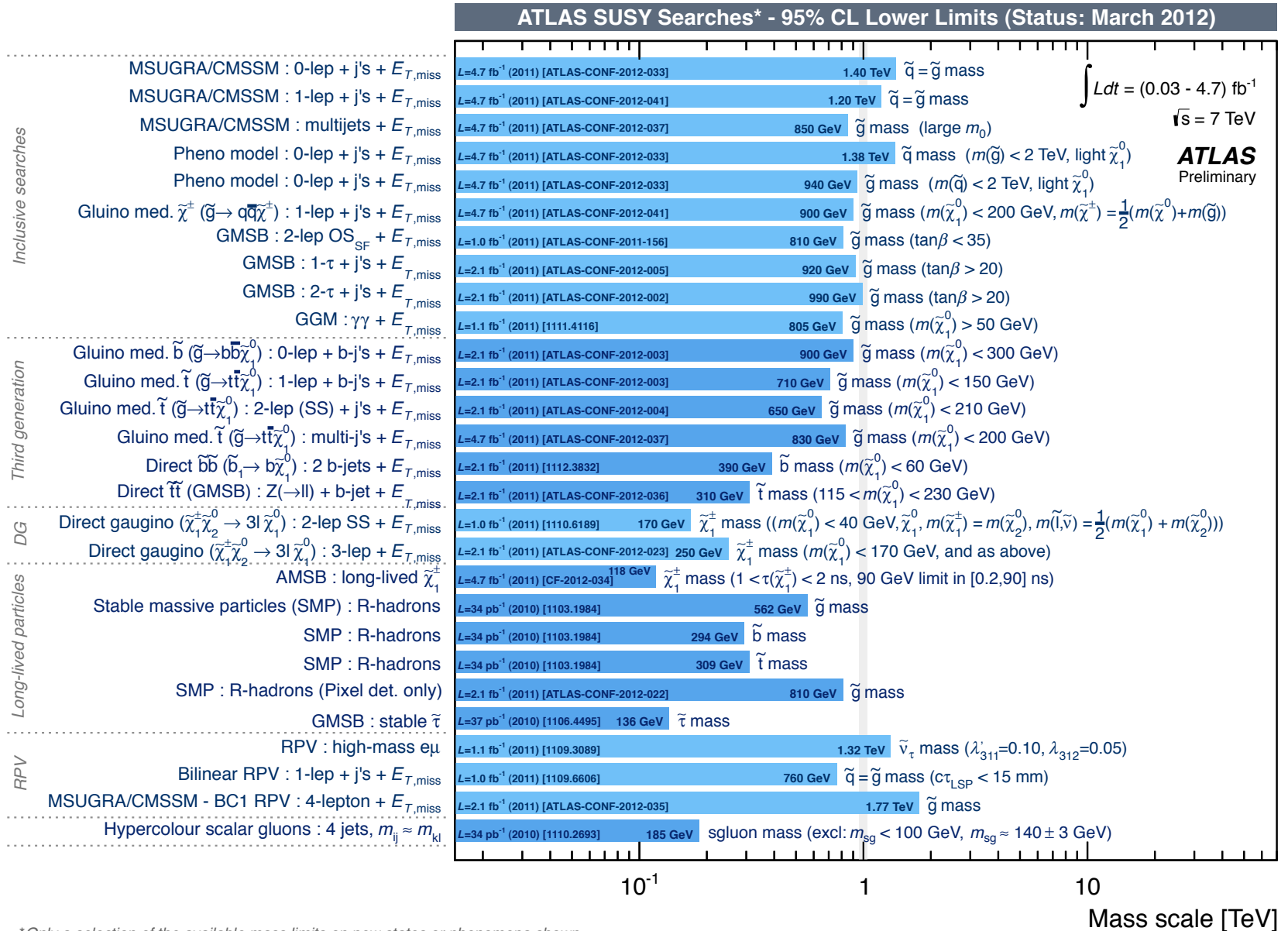
Summary of SM Cross Section Measurements



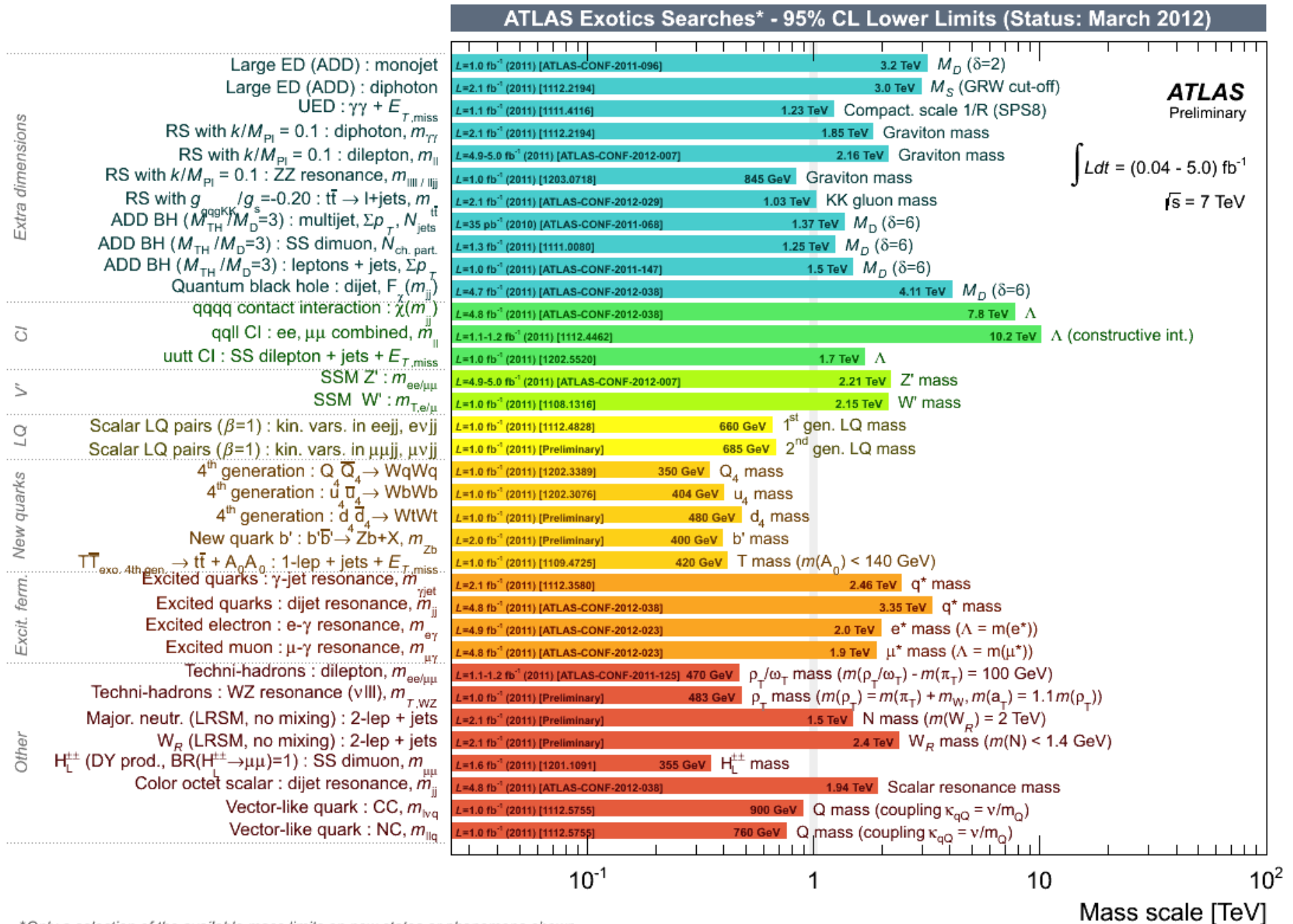
Top



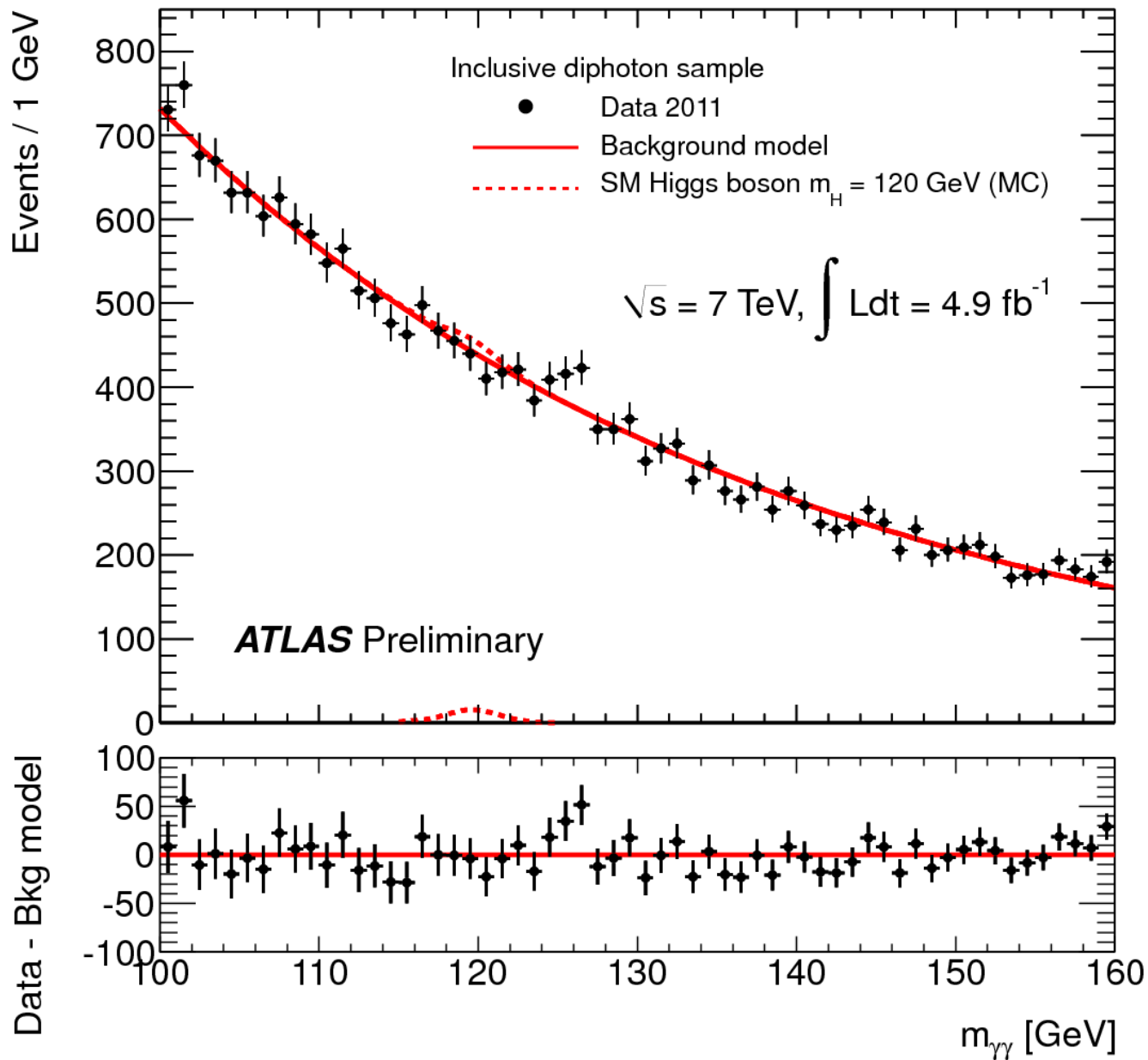
SUSY



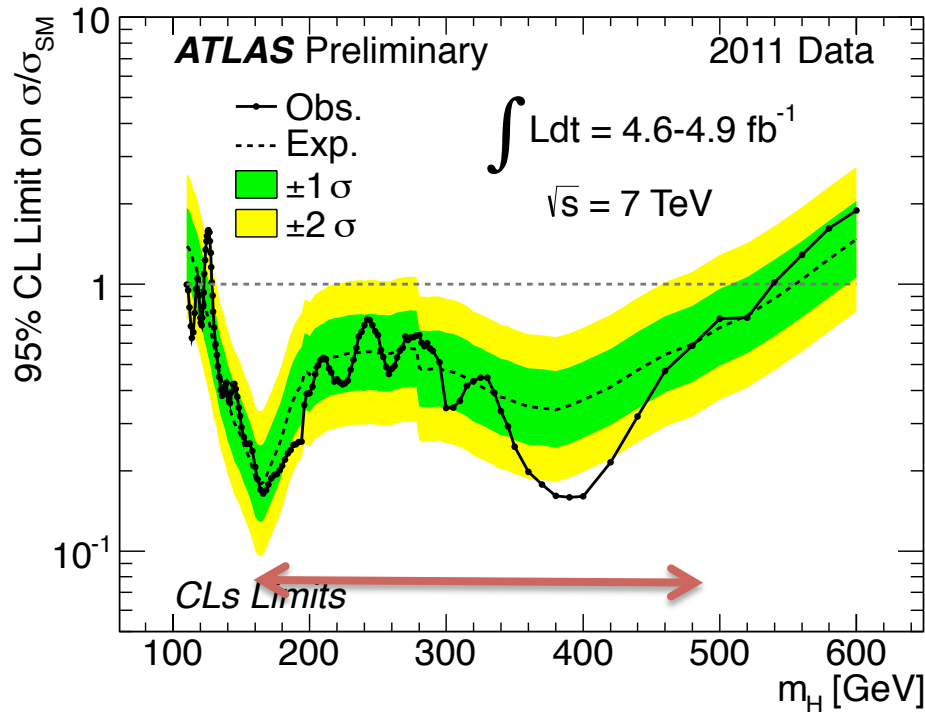
Exotics searches



2011 Higgs Search Results

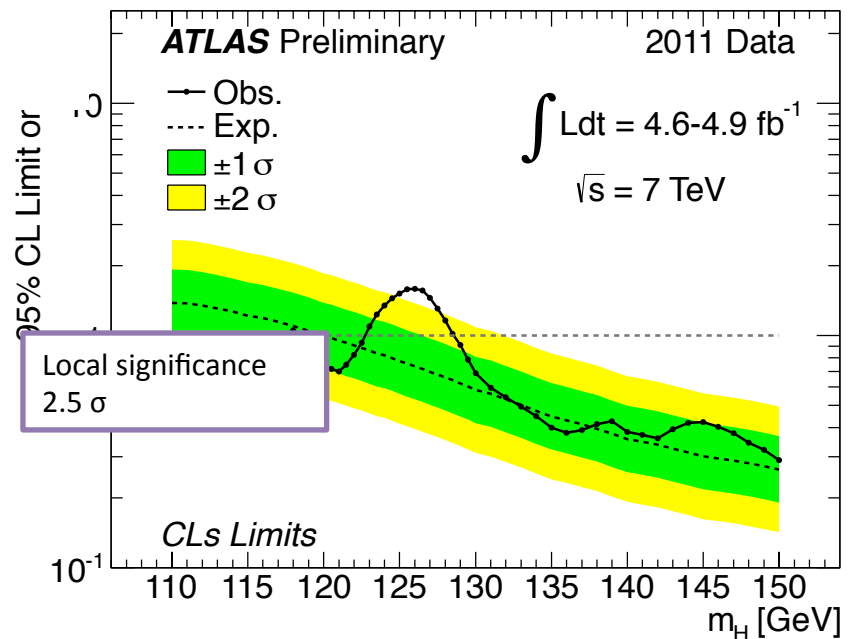


2011 Higgs Search Results

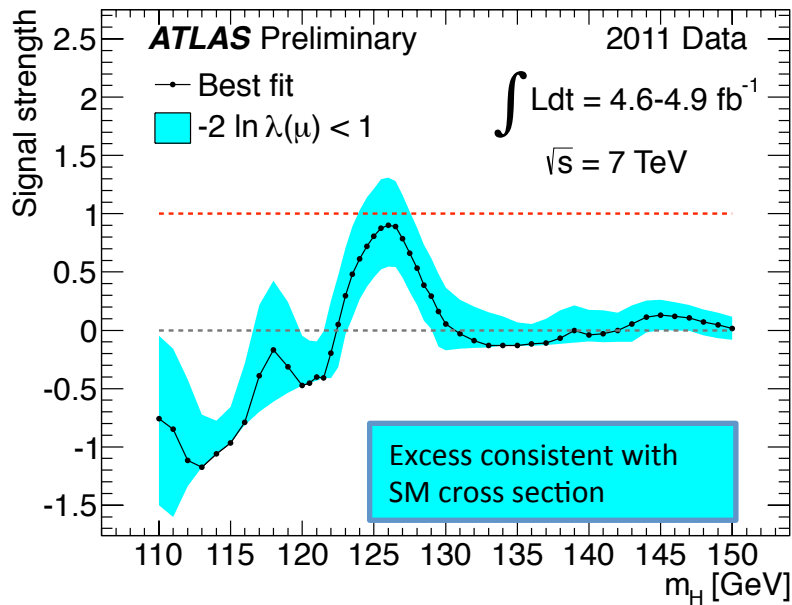


Region between 130 and 486 GeV
 excluded at 99% C.L.

Excess seen in the low mass region:

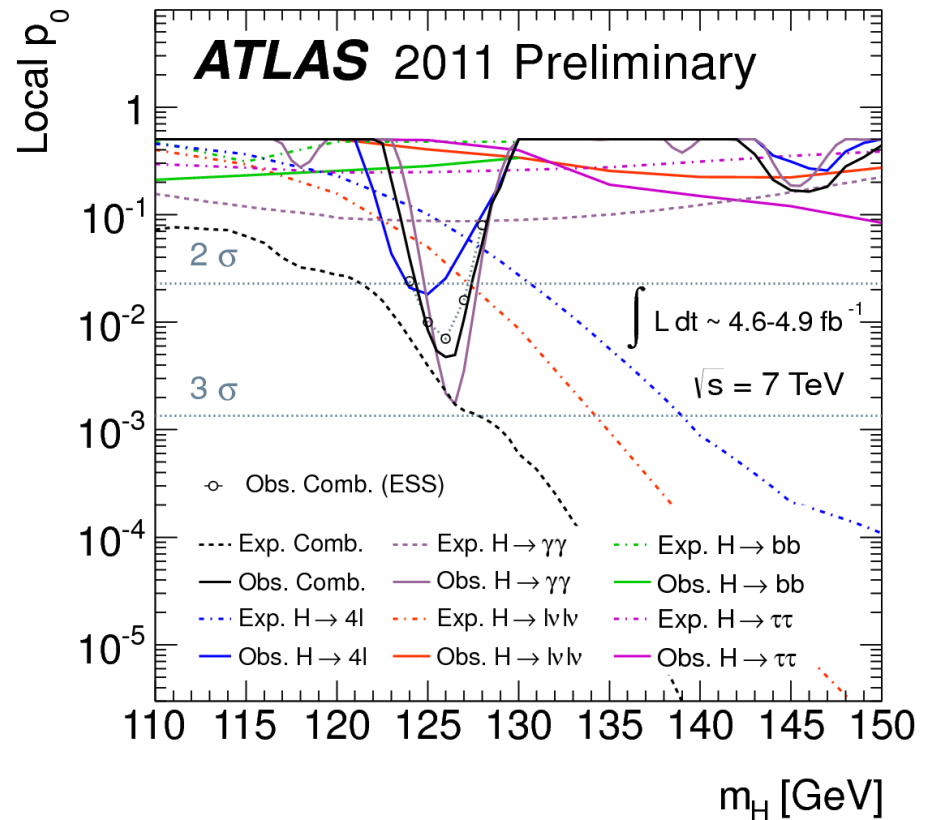


2011 Higgs Search Results



Many interesting Higgs questions:

- Is there more than one Higgs?
- Are the couplings what one expects?



9. Title: **Combined search for the Standard Model Higgs boson using up to 4.9 fb⁻¹ of pp collision data at root s=7 TeV with the ATLAS detector at the LHC**

Author(s): Aad G.; Abbott B.; Abdallah J.; et al.

Group Author(s): ATLAS Collaboration

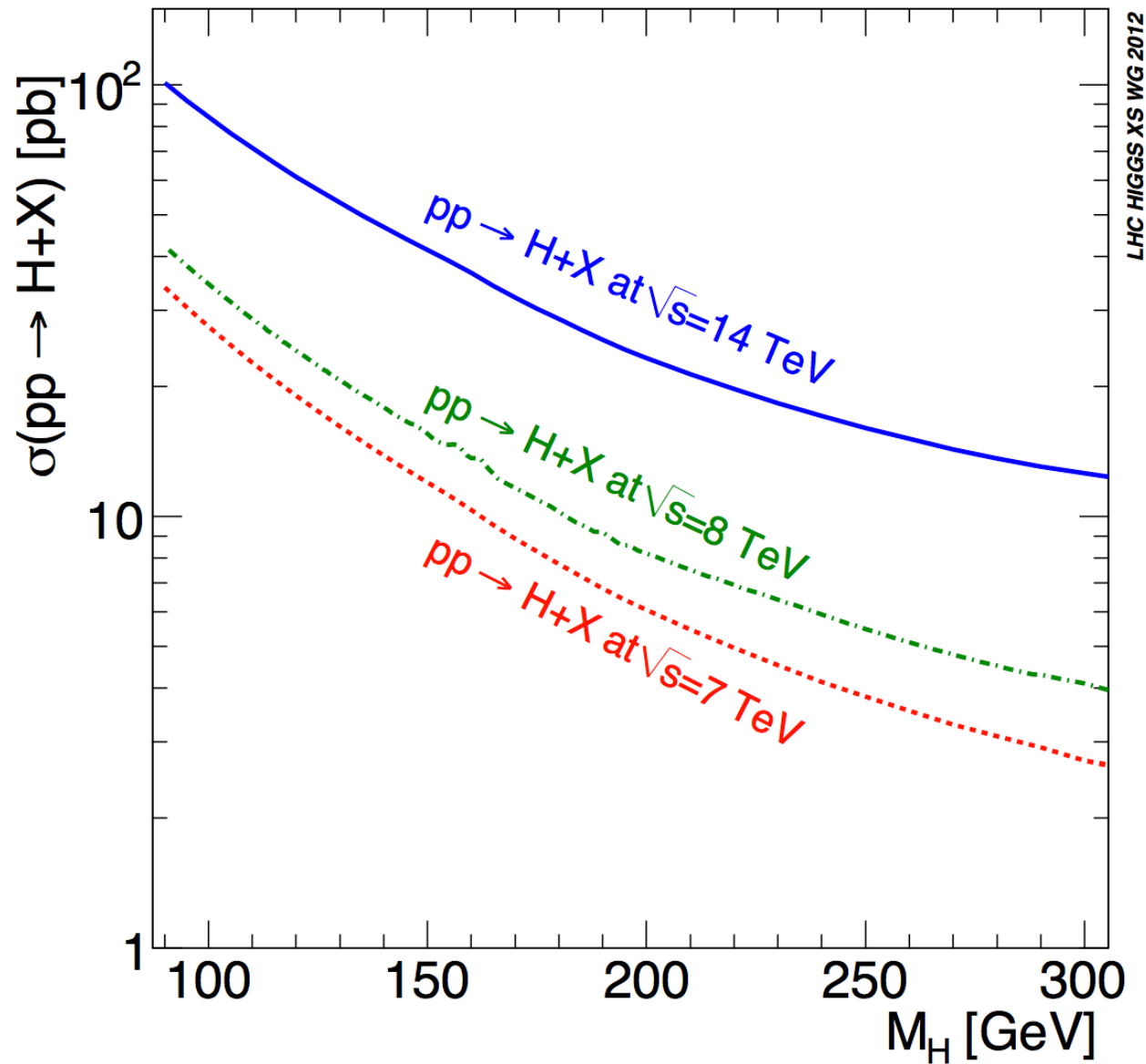
Source: PHYSICS LETTERS B Volume: 710 Issue: 1 Pages: 49-66 DOI: 10.1016/j.physletb.2012.02.044 Published: MAR 29 2012

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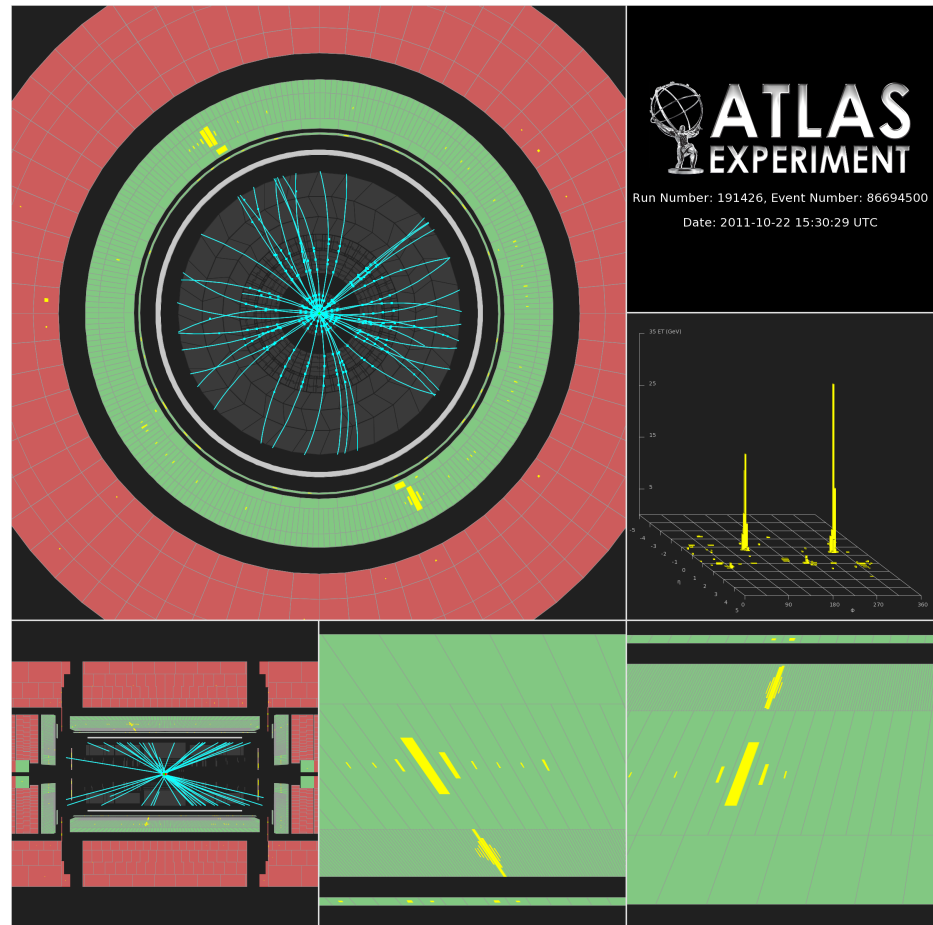
20

Higgs cross-section at 8 TeV



2012 Higgs Results ?

- Please wait until the
 - Independence Day, 9:00 am
 - Results on 2012, and 2011+2012 Higgs search will be presented at a CERN Public Seminar from the ATLAS and CMS experiment



LECCE CONTRIBUTIONS

Lecce Contributions

- Hardware
 - Riparazioni gas inlets (GF, AI, AM)
 - Manutenzione RPC (MB, GF ,AI , AM)
- Detector Performance
 - Muon High Level Trigger Performance (MB, EG, MP, AV)
 - Muon Trigger Validation (AV)
 - RPC Data Quality (MB)
 - RPC Performances (GC, NO, SS)
 - Muon Software (SS)
 - Muon Reconstruction Efficiency at low pt with J/Psi (GC ,NO ,SS)
- Physics
 - SUSY searches with 1 lepton, missing E_T and Jets (MB ,EG ,MP ,AV)
 - Search for Heavy Stop with dileptons, missing E_T and Jets with MT2 variable (MB ,EG ,MP ,AV)
 - Background Estimation for SUSY SS dilepton searches (MB, EG, MP, AV)
 - Search for Heavy Stop with dileptons, missing E_T and Jets using multivariate analysis (MB, EG, MP, AV & LL, MR)
 - Z/W+ b production (GC, NO, SS)
 - J/psi cross section (GC, NO, SS)

μ reconstruction efficiency at low p_T from data with J/ψ -1

- ☐ G. Chiodini, N. Orlando, S. Spagnolo
- ☐ **misura di performance fondamentale per il programma di fisica del b, di interesse crescente nella search dell' Higgs per aumentare l' accettazione abbassando le soglie in p_T sui leptoni**
- ☐ pubblicazione per conferenze: ATLAS-CONF-2011-021 basata sui dati del 2010 ($\sim 3\text{pb}^{-1}$) **approvato (discusso l' anno scorso); 23 autori**
 - ☐ **N. Orlando** on behalf of the ATLAS Collaboration, "Measurement of the muon reconstruction efficiency in ATLAS", **poster presented at Hadron Collider Physics Symposium 2011**, Paris, November 14–18, 2011
 - ☐ **N. Orlando** on behalf of the ATLAS Collaboration, "J/Psi production cross section and non-prompt fraction measurement with the ATLAS detector", IFAE 2011, Nuovo Cimento C 034, 260 (2011)
- ☐ update con il processing finale dell' intero data set del 2010: condotto solo da Lecce: **ATLAS-COM-CONF-2011-192; 3 autori**; signed-off da EdB e passato al meeting di approval; draft in fase di revisione per definizione della versione pubblica
- ☐ articolo in preparazione ATL-COM-PHYS-2012-069 basato su questi e altri risultati: "Muon Reconstruction Efficiency and Momentum Resolution of the ATLAS Experiment in Proton-Proton Collisions at $\sqrt{s} = 7$ TeV in 2010"
- ☐ in aggiornamento con dati del 2011: Harvard + Lecce + Indiana + CERN + Bologna + Kobe ATL-COM-MUON-2012-013

Information	Discussion (46)	Files
Internal Note		
Report number	ATLAS-COM-CONF-2011-192	
Title	A measurement of the muon reconstruction efficiency in 2010 ATLAS data using jpsi decays	
Author(s)	Chiodini, G (INFN Lecce) ; Orlando, N (INFN Lecce and Dip. di Fisica, Univesità del Salento) ; Spagnolo, S (INFN Lecce and Dip. di Fisica, Univesità del Salento)	
Imprint	16 Nov 2011 - 15 p.	

Information	Discussion (8)	Files
Internal Note		
Report number	ATL-COM-MUON-2012-013	
Title	Muon Efficiency Plots Using J/psi Tag and Probe in 2011 Data	
Author(s)	Spearman, W ; Catmore, J ; Chiodini, G ; Matsushita, T ; Corradi, M ; Mills, C ; Orlando, N ; Price, D ; Yang, Y ; Spagnolo, S ; Guimaraes da Costa, J Hide	
Imprint	17 May 2012. - 12 p.	
Subject category	Detectors and Experimental Techniques	
Accelerator/Facility	LHC	

DS record
2.

presented. The measurement
y of $\sqrt{s}=7\sim\text{TeV}$,
ous determination of the
ematic uncertainties. In

μ reconstruction efficiency at low p_T from data with J/ψ -2

- $J/\psi \rightarrow \mu\mu$ campione ad alta statistica di muoni di $\sim$ basso p_T
 - selezione di un muone ricostruito con buona qualita' (tag) e di una traccia dell' ID (probe); $M_{\text{inv}}(\text{tag-probe})$ nell' intervallo 2-3.6 GeV
 - le probe costituiscono un campione **non biasato** di muoni per testare l' efficienza di ricostruzione
 - alta contaminazione del sample
 - sistematica dominante: sottrazione del fondo
 - un nuovo tipo di probe a fondo ridotto: Calo Tagged Muons utilizzata oltre a ID-tracks.
 - risultati consistenti

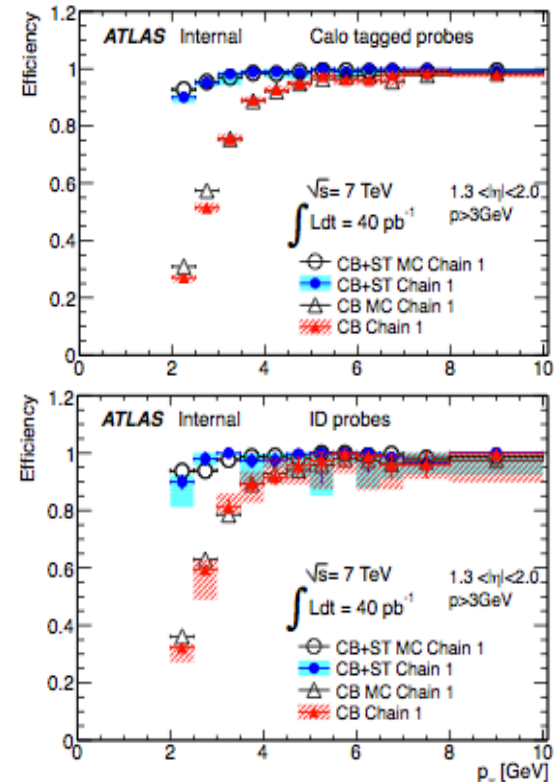
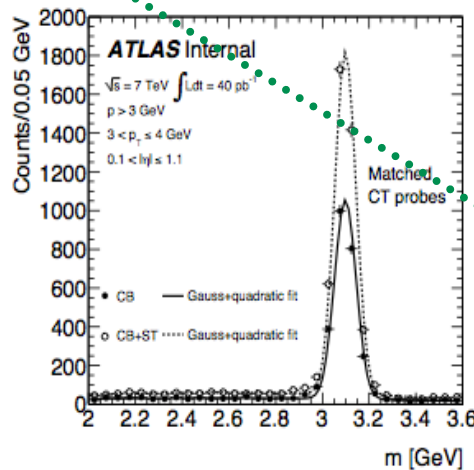
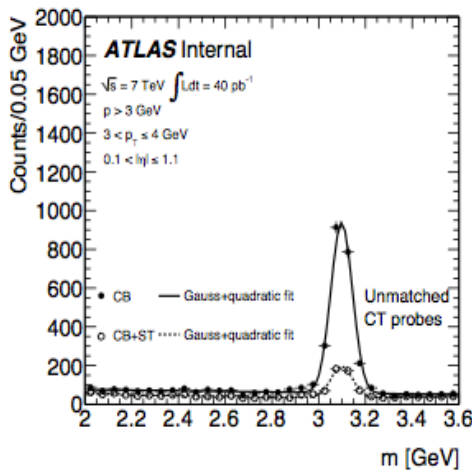
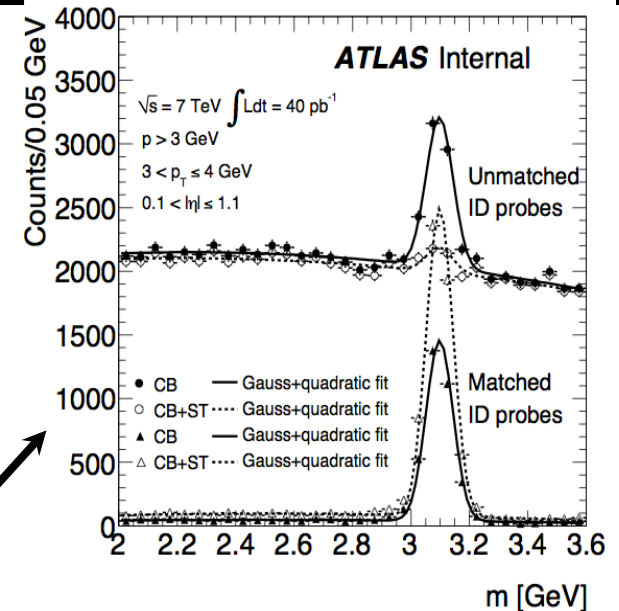


Figure 4: Invariant mass of the unmatched (left plot) and matched (right plot) tag-and-probe pairs for CB (solid circles) and CB+ST (open circles) muons of chain 2 for $0.1 < |\eta| < 1.1$ and $3 < p_T < 4 \text{ GeV}$. The probes are selected among calorimeter-tagged muons. The curves show the fits described in the text.

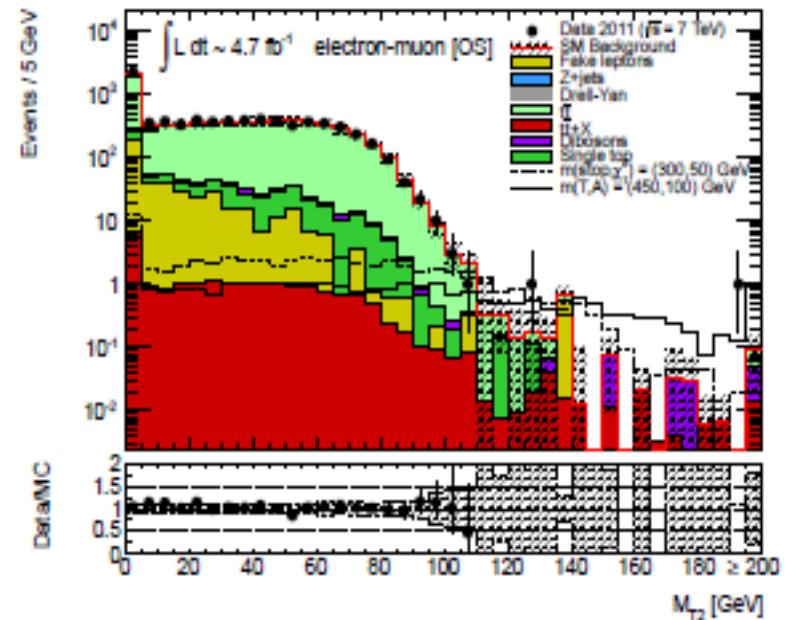
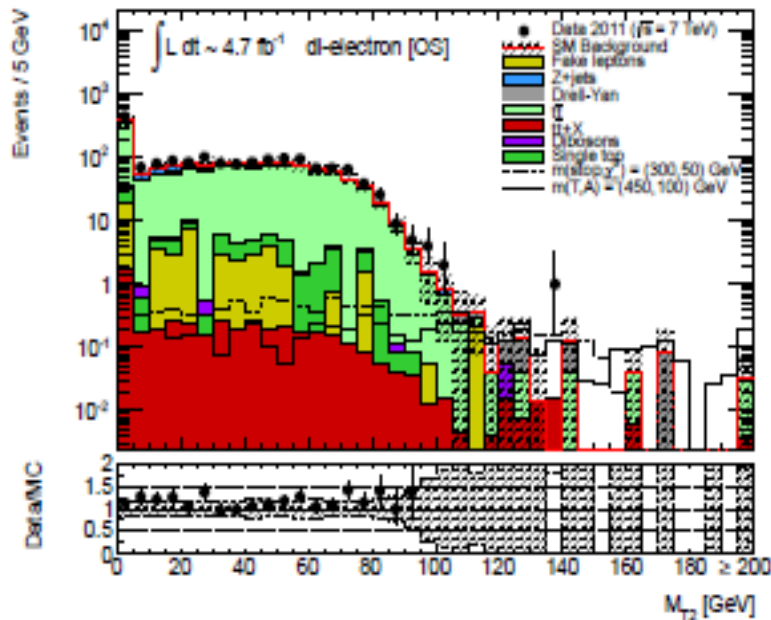
Search for a heavy top partner in final states with two leptons

M.Bianco, E.Gorini, M.Primavera, A.Ventura with Milano, Pavia and Udine Groups

❖ Discrimination between signal and background is based on the kinematics of the two leptons and transverse missing momentum using the M_{T2} variable¹:

- For fully leptonic $t\bar{t}$, Wt and WW events M_{T2} has upper bounds equal to the W boson mass. This is not the case for the signal (E_{T}^{miss} receives contribution also from invisible particles upstream the top decay):

$$m(\tilde{t}) - m(\tilde{\chi}_1^0)$$
- ✓ For $\tilde{\chi}_1^0 t$ the end-point depends on

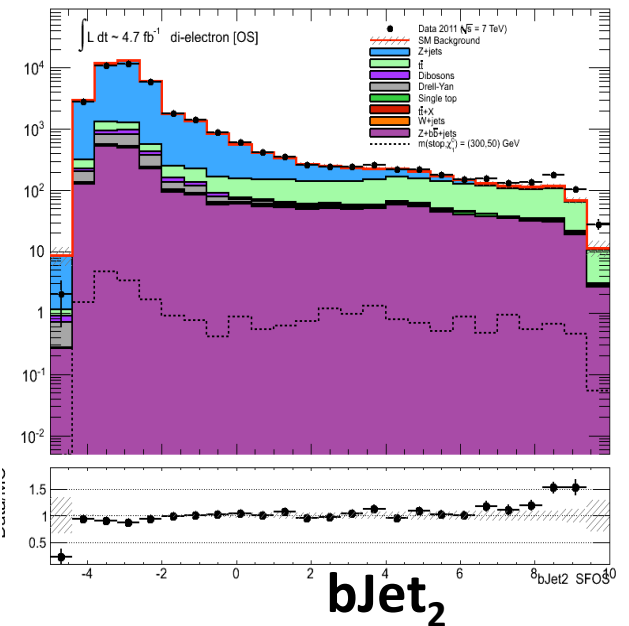
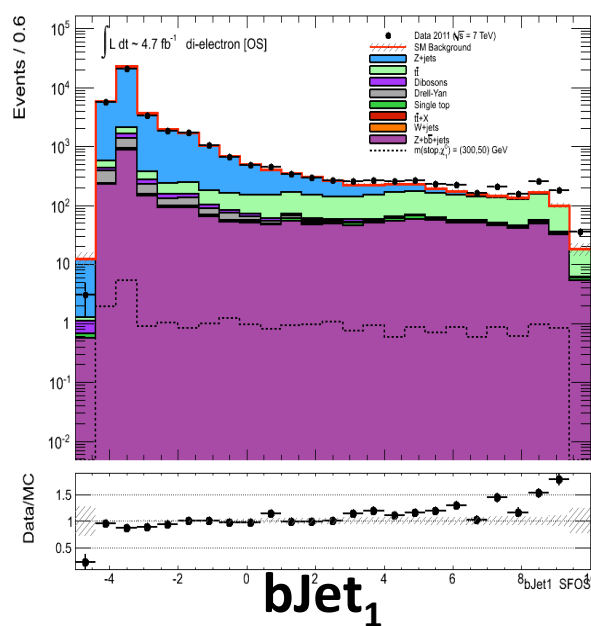
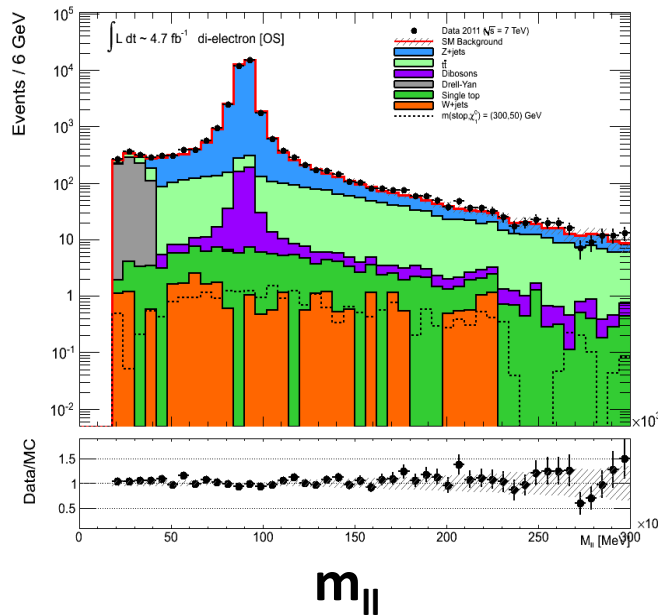
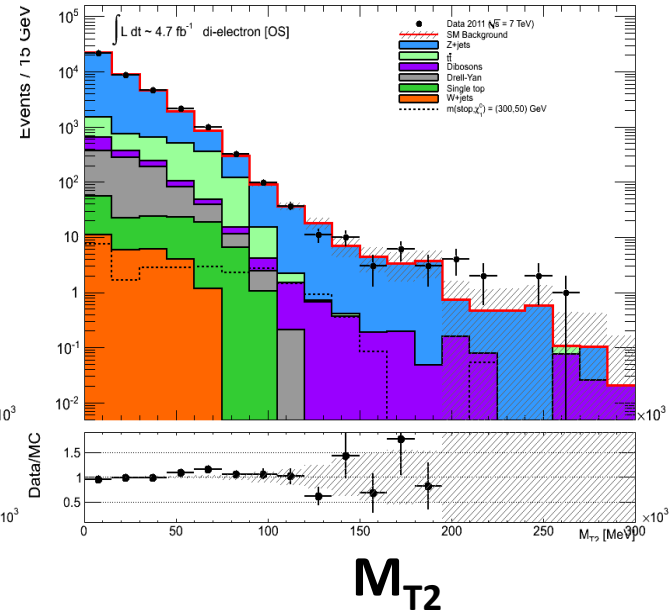
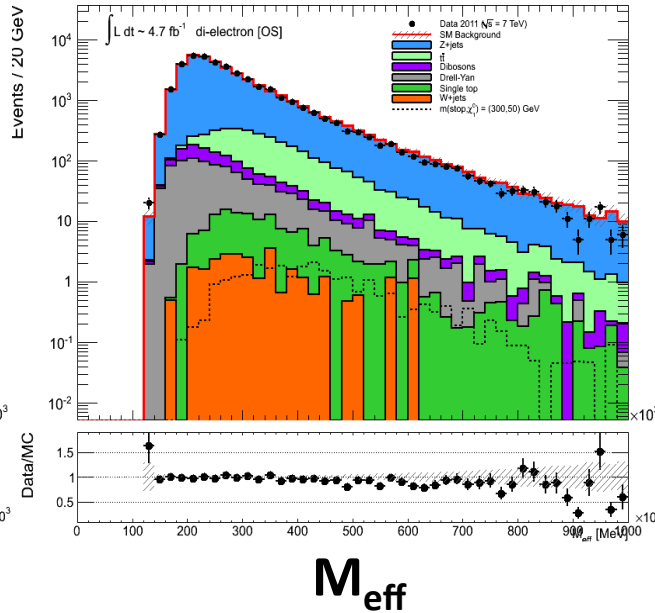
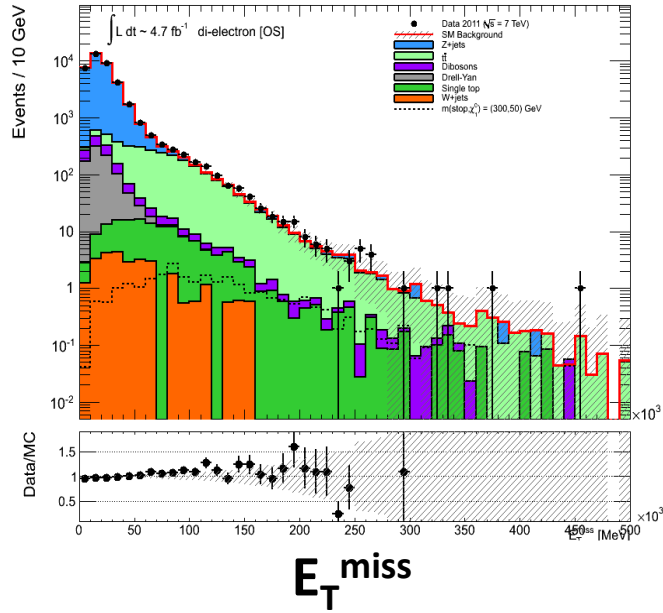


¹ arXiv:hep-ph/9906349; arXiv:hep-ph/0304226

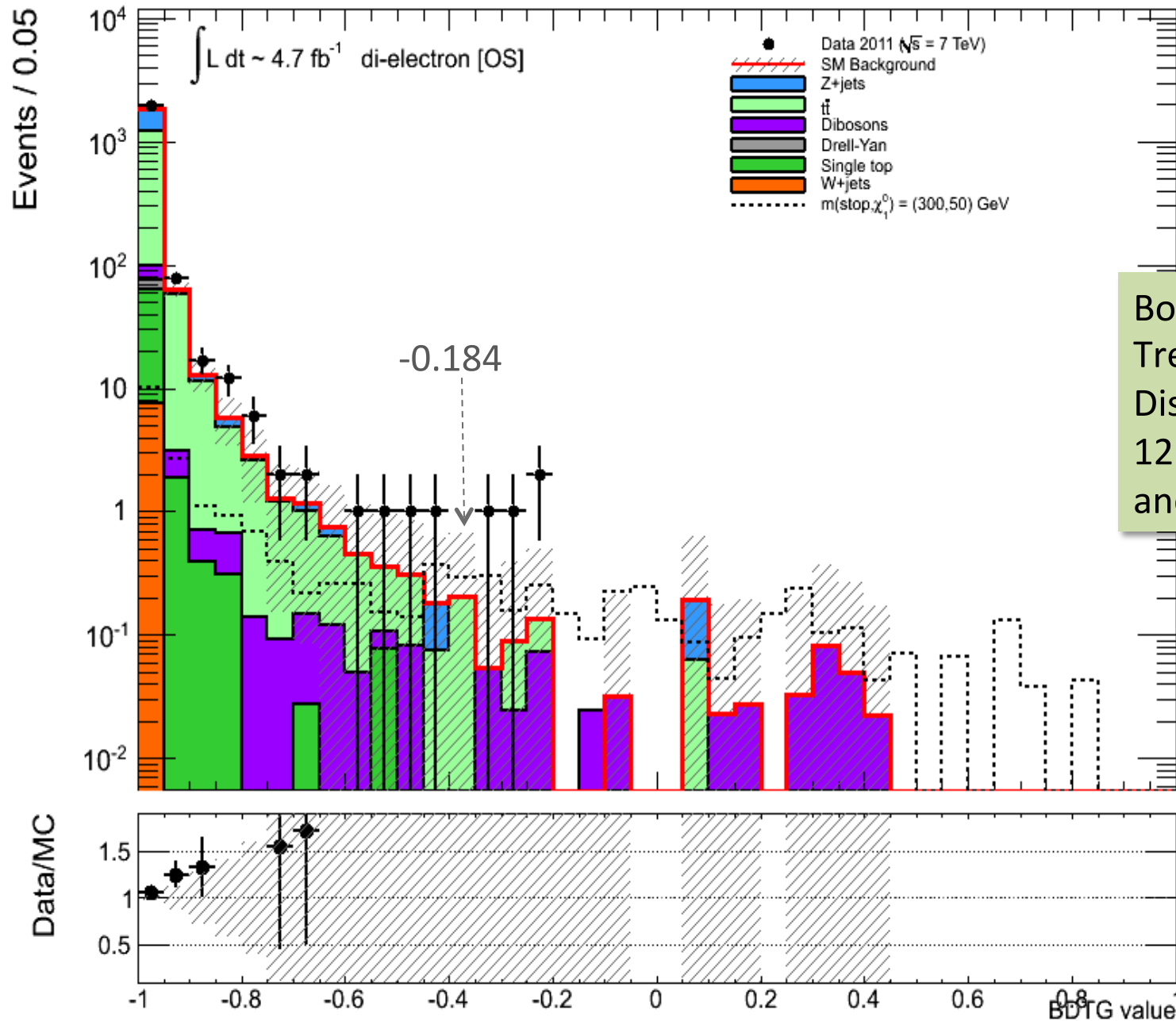
Search for a heavy top partner in final states with two leptons with multivariate analysis

Input Variables Distributions

M.Bianco, E.Gorini, M.Primavera, A.Ventura

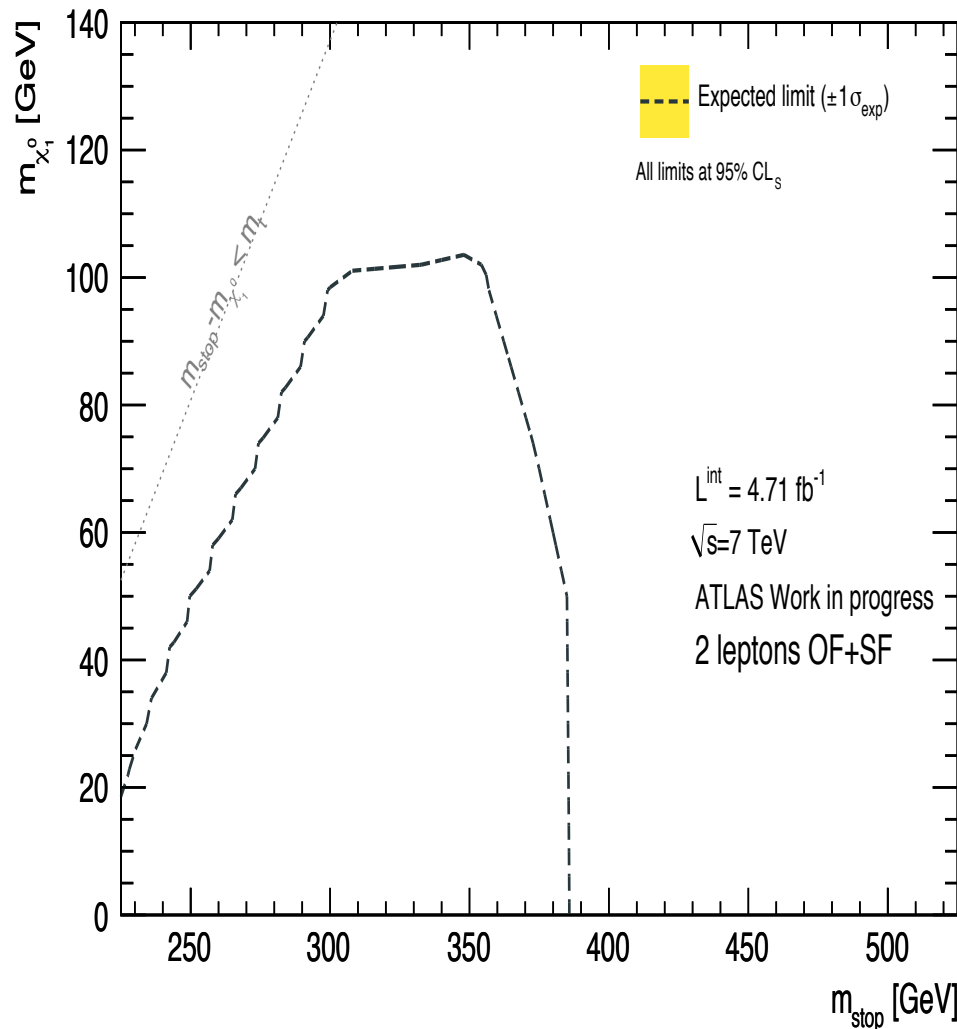


Search for a heavy top partner in final states with two leptons with multivariate analysis

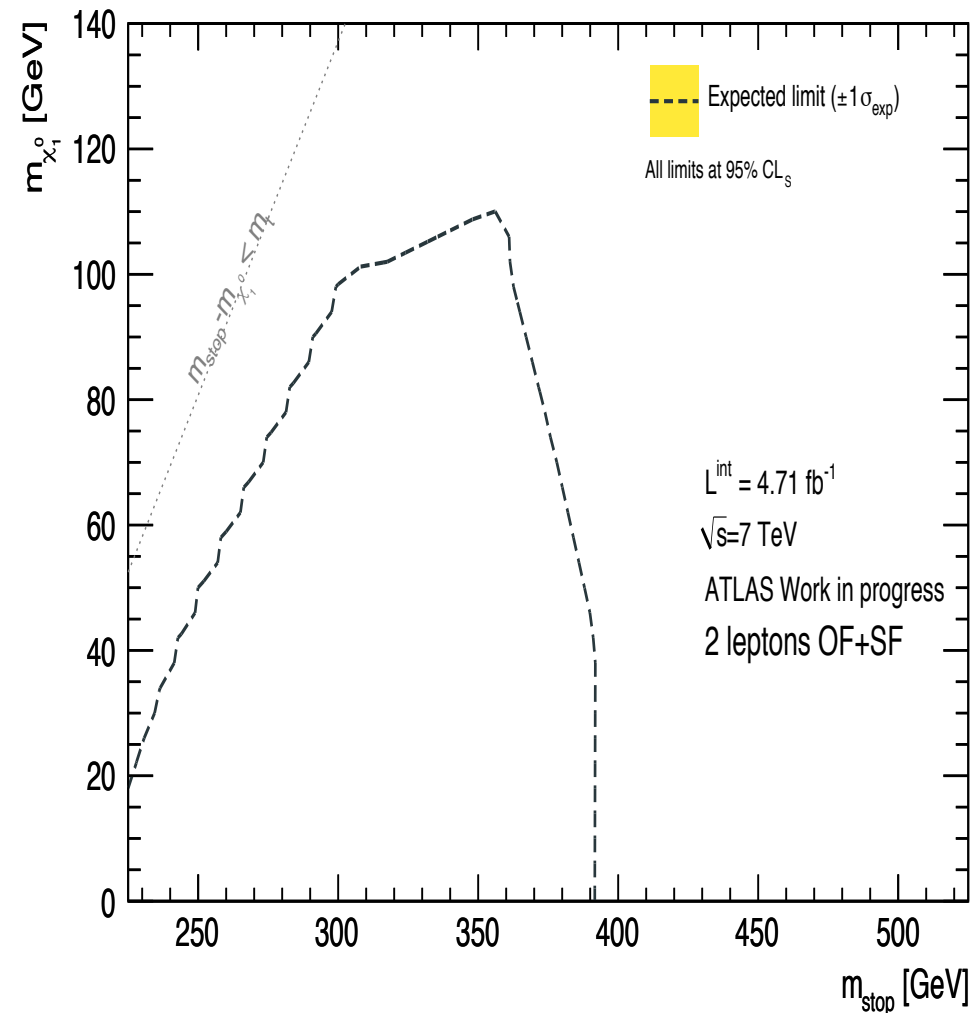


Search for a heavy top partner in final states with two leptons with multivariate analysis

Exclusion Plots in the Neutralino-Stop Plane



SF+OF cut11



SF+OF cut12

No systematics taken into account for the moment

Talks

- ◆ G. Chiodini, Status of Higgs search in ATLAS
Workshop on Interpreting LHC Discoveries, Galileo Galilei Institute for Theoretical Physics (GGI)
- ◆ N. Orlando, J/Ψ production cross section and non-prompt fraction measurement with the ATLAS detector
Incontri di Fisica delle Alte Energie 2011, Perugia (Italy), Apr. 27-29 (2011)
- ◆ M. Primavera, SUSY searches at ATLAS
15th Lomonosov Conference on Elementary Particle Physics, Moscow (Russia), Aug. 18-24 (2011)
- ◆ A. Ventura, ATLAS Overview
New Trends in High-Energy Physics (experiment, phenomenology, theory), Alushta (Ukraine), Sept. 3 - 10 (2011)
- ◆ N. Orlando, J/Ψ production cross section and non-prompt fraction measurement with the ATLAS detector
Incontri di Fisica delle Alte Energie 2011, Perugia (Italy), Apr. 27-29 (2011)
- ◆ N. Orlando, Heavy flavor production cross section in association with W/Z in the ATLAS experiment
POSTER, Società Italiana di Fisica 2011, L'Aquila (Italy), Sept. 26-30 (2011)
- ◆ N. Orlando, Measurement of the muon reconstruction efficiency in ATLAS,
POSTER, Hadron Collider Physics Symposium 2011, Paris (France), Nov. 14-18 (2011)

Editorial Boards

EXOT-2011-24

DBL - WZ to $\ell\nu\ell$ resonance search

Phase 1: Finished

Phase 2: Finished

Submission: Finished

Search for resonant WZ production in the WZ to $\ell\nu\ell$ channel in $\sqrt{s} = 7$ TeV pp collisions with the ATLAS detector

Leading Group: EXOT

Planned journal: PRD

Contact editors: Else Lytken, James Ferrando, Junjie Zhu, Koji Terashi, Nicolas Berger, Thomas Gadfort

Journal of final submission: PRD

Editorial board: Hans Peter Beck, Ivor Fleck, Stefania Spagnolo, Tetiana Hryn'ova

Date of journal submission: 2012/04/07

EXOT-2012-11

DBL - Diboson $\ell\nu\ell$ resonance search

Phase 1: Finished

Phase 2: Active

Submission: Not Started

Search for heavy resonance decaying to WW to $\ell\nu\ell$

Leading Group: EXOT

Planned journal: Letter

Contact editors: Else Lytken, Junjie Zhu, Koji Terashi, Lulu Liu, Sara Borroni

Journal of final submission:

Editorial board: Ivor Fleck, Lucia Di Ciaccio, Mark Neubauer, Stefania Spagnolo

Date of journal submission:

EXOT-2012-12

DBL - Diboson $\ell\nu\ell$ resonance search

Phase 1: Active

Phase 2: Not Started

Submission: Not Started

Search for heavy resonance decaying to WZ to $\ell\nu\ell$

Leading Group: EXOT

Planned journal: Letter

Contact editors: Else Lytken, Junjie Zhu, Koji Terashi, Marjorie Shapiro, Merlin Davies, Peter Loscutoff, Sara Borroni

Journal of final submission:

Editorial board: Ivor Fleck, Lucia Di Ciaccio, Mark Neubauer, Stefania Spagnolo

Date of journal submission:

Note In Preparation

Performance of the 2011 tau trigger

Phase 1: Active

Performance of the ATLAS tau trigger in 2011

Leading Group: TRIG

Editors: Cristobal Cuenca Almenar, Mansoor Shamim, Phillip Urquijo, Soshi Tsuno

Other Groups:

Contact editors: Maria Pilar Casado, Soshi Tsuno

EdB Chair: Sarah Demers

Editorial board: Martin Aleksa, Sarah Demers, Stefania Spagnolo

PRIN e FIRB

- **FIRB** Andrea come PI
 - Titolo: Ricerca di Nuova Fisica alla scala del TeV attraverso lo studio e l'interpretazione dei risultati del Large Hadron Collider mirati a soluzioni del problema della naturalezza e della materia oscura
 - Unità: Salento, Udine, INFN
 - Insieme a diversi teorici (Coriano, Montanino)
 - Purtroppo **non selezionato** da Unisalento (1 ING, 3 Umanisti)
 - Acquisita esperienza per il prossimo anno.
- **PRIN** Edoardo come Responsabile Locale
 - Responsabilità Nazionale: P.Bagnaia, Roma “La Sapienza”
 - Titolo: Oltre il Modello Standard delle interazioni fondamentali: nuovi rivelatori per il riconoscimento di eventi rari in collisori ad alta luminosità.
 - Unità: Bologna, Cosenza, LNF, Napoli, Roma “La Sapienza”, Roma “Tor Vergata”, Roma Tre, Salento
 - Richiesto 2M€, circa 250k€ per unità di Lecce
 - Compito Lecce: R&D sugli RPC e sulle MicroMegas
 - **Approvato alla Sapienza**

Tier3 ATLAS

- Cluster:
 - 4 macchine 8 core, 4 macchine 12 core acquistate con residui gruppo I e ATLAS
 - 30 TB Storage
 - Performance ne ha parlato Enrico nel report del Calcolo
- Grid Enabled:
 - Software ATLAS in automatico, sviluppo codice in loco
 - 20 TB di Localgroupdisk
 - Sottoscrizione ATLAS Datasets
- PROOF on Demand (POD):
 - Permette analisi di ntuple di ROOT in parallelo, permettendo di allocare risorse direttamente all'utente
 - Sul Cluster ATLAS: fino a 160 cores in Hyperthreading
 - Installato per test anche su alcuni degli iMac di ATLAS (4).
Richiede automount NFS per completare installazione

Studenti

- Triennali:
 - Benedetta Tafuri: luglio 2011
Variabili cinematiche utilizzate nella ricerca della supersimmetria con conservazione della R-parità all'esperimento ATLAS (Gorini)
 - Alessandro Mirto: ottobre 2011
Misure Data Driven del Charge Flip Rate nel decadimento del bosone Z all'esperimento ATLAS (Gorini)
 - Fausto Sirsi: aprile 2012
Metodi di analisi multivariata dei dati per la ricerca di Nuova Fisica all'esperimento ATLAS (Ventura)
 - Marta Dell'Atti: aprile 2012
Studio di scenari oltre il Modello Standard all'esperimento Atlas a LHC con tecniche di analisi multivariata (Primavera)
- Magistrale:
 - Marilea Reale, Borsa Erasmus al CERN (giugno-settembre)
in corso, analisi Multivariate per la ricerca di SUSY
 - Luigi Longo, Borsa Erasmus al CERN (giugno-settembre),
in corso, analisi Multivariate per la ricerca di SUSY
 - Annalisa De Lorenzis, in arrivo a breve
- Dottorato:
 - Nicola Orlando: secondo anno, simil-fellow al CERN (luglio 2011-giugno 2012)

Conclusions

- **ATLAS is operating exceptionally well: collects data, trigger, processes and analyzes data delivered by LHC in a very efficient way**
 - 5 fb⁻¹ collected in 2011 and already 6.2 in 2012 (2 months data taking)
 - Expects from 16 to 20 fb⁻¹ for the end of the year
- **Many new physics results obtained with 2011 data**
 - Probing strong and electroweak sector of the Standard Model in new energy regime
 - Some Hints for the Standard Model (?) Higgs Boson.... ?? !!!
 - Searches for new physics truly probe TeV scale in many signatures
 - No deviation from SM found yet though => hope for this to change!
 - No sign of Dark Matter yet
 - For all ATLAS results see <https://twiki.cern.ch/twiki/bin/view/AtlasPublic>
- **Wait for the Wednesday for some new, very exciting results from CERN**