HEP 2013
Stockholm
18-24 July 2013

(info@eps-hep2013.eu)

EPS-HEP 2013

2013 Europhysics conference on High Energy Physics
18-24 Juillet 2013, Stockholm, Suède

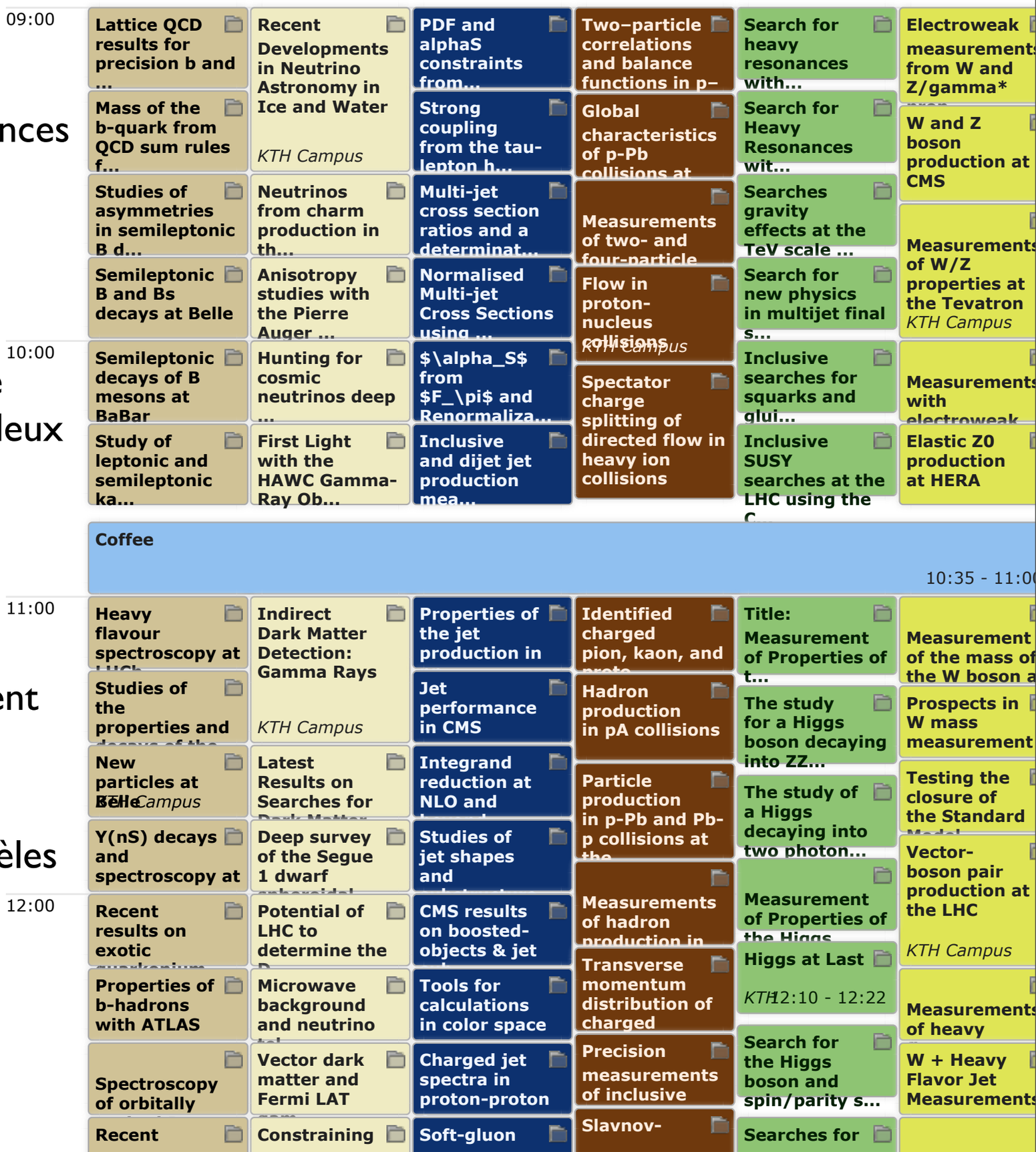
- En physique des particules, conférences d'hiver (Moriond) et d'été (ICHEP, Lepton-Photon, EPS-HEP)

- EPS-HEP: conférence européenne, organisée sous l'égide de la Société Européenne de Physique, tous les deux ans dans un endroit différent

- 1 semaine, à Stockholm

- Plus de 750 participants littéralement du monde entier

- 3 premiers jours de sessions parallèles (6 sessions, 15 à 20 minutes sur un sujet spécifique)



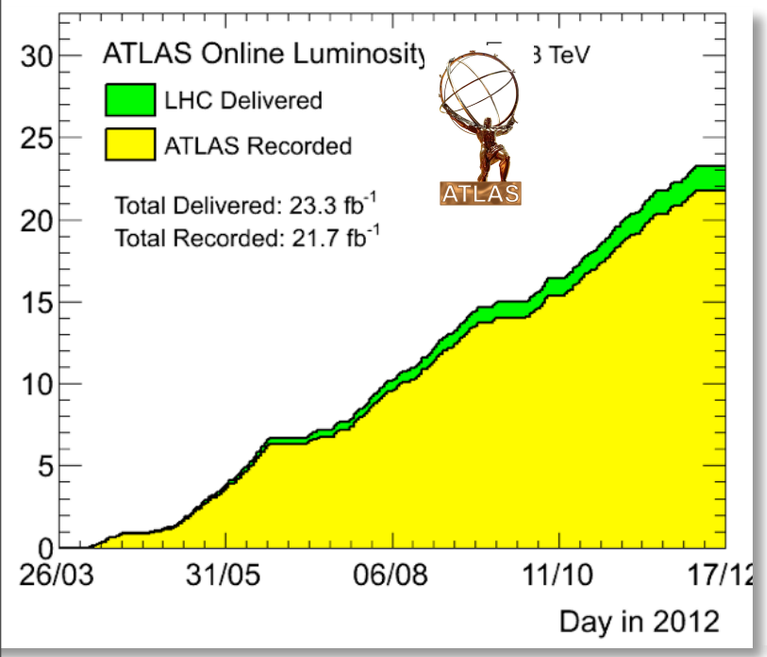
- Un dimanche pour digérer les résultats, travailler, faire du tourisme...
- 3 jours de sessions plénières (exposés plus longs sur un domaine)
- Une intervention de Peter Higgs et une conclusion de Gerardus 't Hooft
- Des prix - en particulier l'EPS Prize, précurseur du Prix Nobel, cette année : *ATLAS and CMS collaborations for the discovery of a new heavy particle with the properties of the long-sought Higgs boson*
- Autant pour les présentations, calibrées, que pour les discussions, informelles, aux pauses (rumeurs...)
- Autres occasions de rencontres: réunions satellites (Beyond the LHC juste après), conférences thématiques, workshops spécialisés, séminaires....

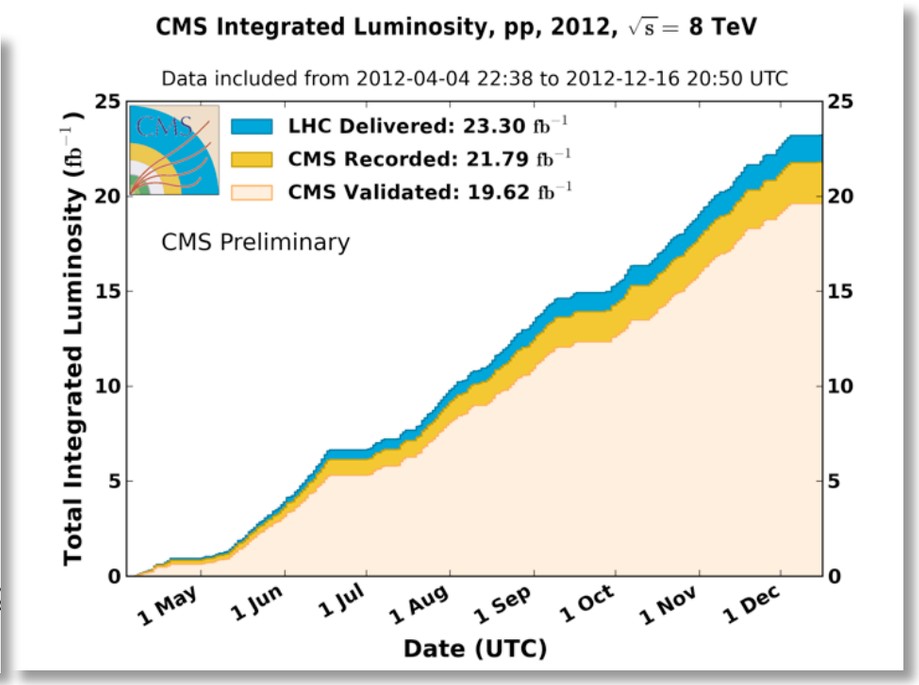
09:00	**Welcome from the Local Organizers** — *Bengt LUND-JENSEN et al.*	*KTH and Stockholm University Campus* 09:00 - 09:04
	Welcome from the Dean of Faculty of Science, Stockholm University — *Anders KARLHEDE*	*KTH and Stockholm University Campus* 09:04 - 09:12
	Welcome from the Dean of the School of Engineering Sciences, KTH — *Leif KARI*	*KTH and Stockholm University Campus* 09:12 - 09:20
	EPS HEPP prize award and talks by recipients	*KTH and Stockholm University Campus* 09:20 - 09:55
10:00	**Cocconi prize award and talks by recipients**	*KTH and Stockholm University Campus* 09:55 - 10:20
	Gribov, Young Physicist and Outreach prize award	*KTH and Stockholm University Campus* 10:20 - 10:30
	Ancestry of a New Boson — *Peter HIGGS*	*KTH and Stockholm University Campus* 10:30 - 11:00
11:00	**Coffee break**	*KTH and Stockholm University Campus* 11:00 - 11:30
	Higgs bosons in the Standard Model and beyond — *Greg LANDSBERG*	*KTH and Stockholm University Campus* 11:30 - 12:00
12:00	**Properties of the new boson** — *Fabio CERUTTI*	*KTH and Stockholm University Campus* 12:00 - 12:30
	The scalar sector of the SM and beyond — *Christophe GROJEAN*	*KTH and Stockholm University Campus* 12:30 - 13:00
13:00	**Lunch**	
14:00		

Un boson nommé Higgs

Excellent machine and detector performance resulted in large amount of data with very high quality: ~95% of delivered data are recorded, and ~90% of those are certified and used in physics publications!

- We publish based on ~85% of all the bunch collisions that took place at the LHC!

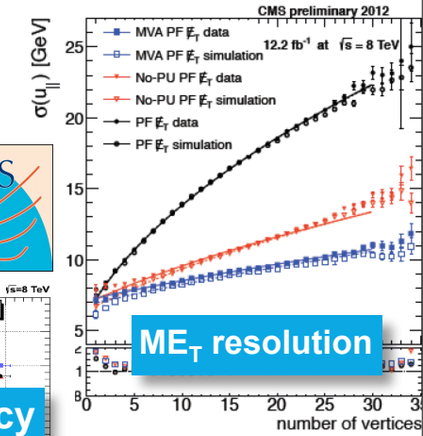


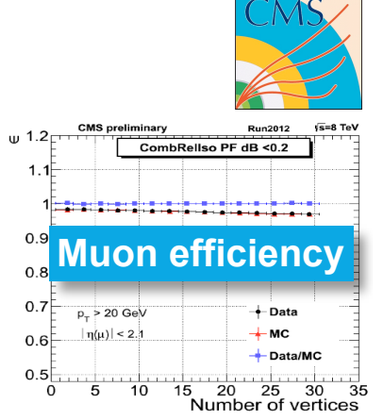


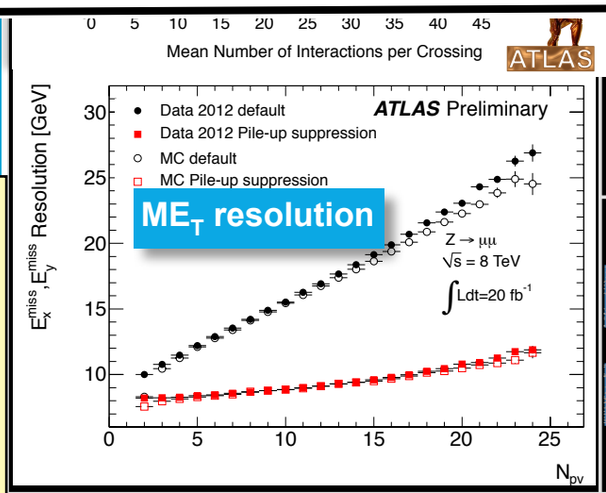
- Beaucoup de collisions...
- Trop en fait (pile-up) !

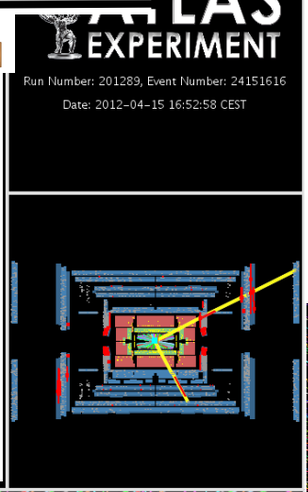
Pileup Mitigation

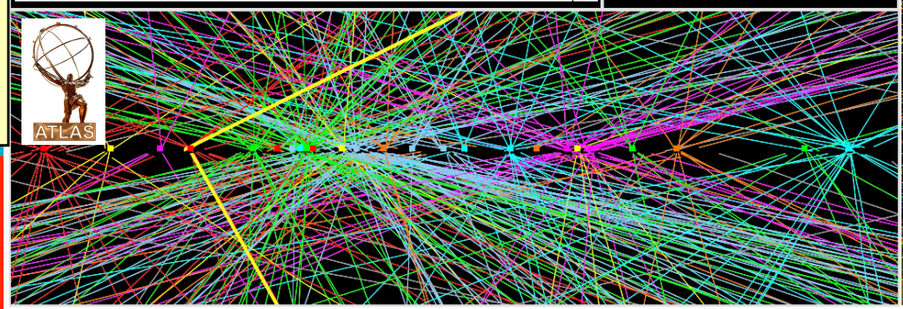
dy reached nominal rate; experiments cope well!

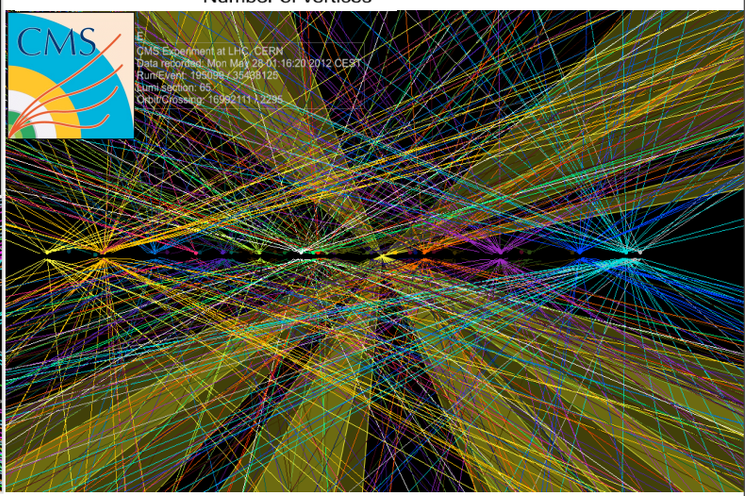








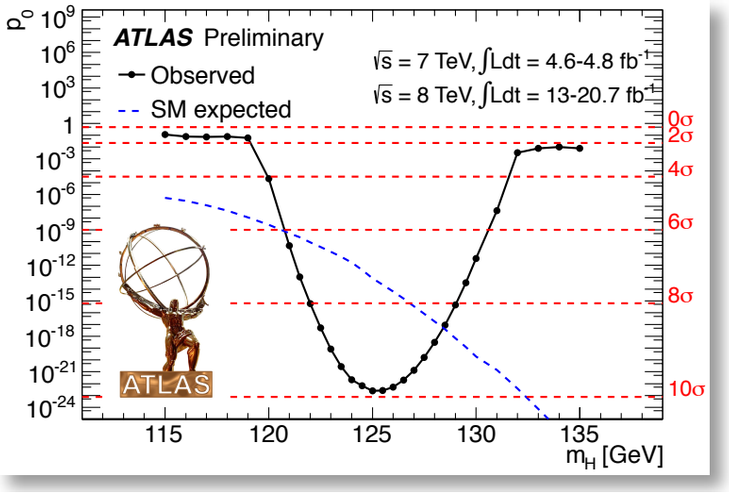




Slide 6

Happy Birthday, Mr. Higgs

- It's been a great year for the Higgses (both Peter and the Boson)!
- Long journey in one year:
  - Established the existence of new particle beyond any doubts (LHC+Tevatron)
  - Mass measured to 0.50% precision, i.e. better than top (or any other) quark mass! (ATLAS+CMS)
  - It is a 0^{++} boson responsible for EWSB, as evident from its relative couplings to W/Z vs. γ (ATLAS+CMS)
  - Established couplings to the third-generation fermions (CMS+Tevatron)
  - Nearly excluded negative couplings to fermions (CMS)
  - Big 5 → big 6: thanks to ttH (bb, $\gamma\gamma$, and $\tau\tau$)
- See more in Fabio Cerutti's talk (next)

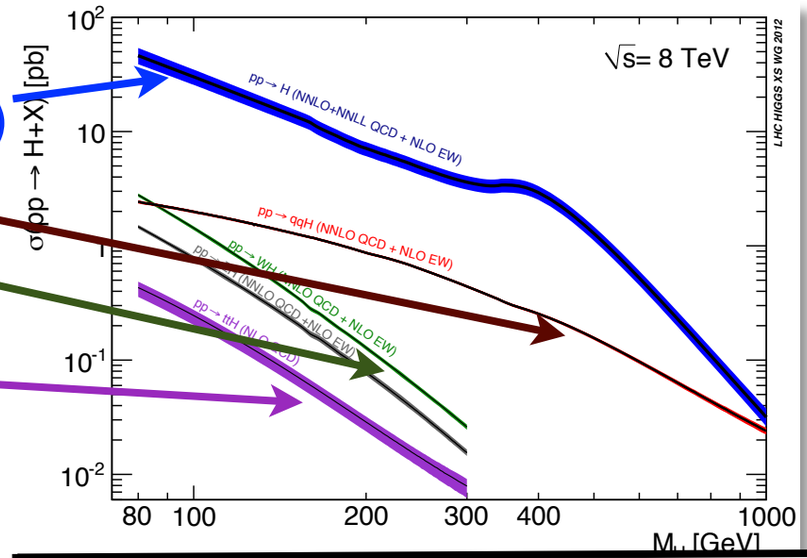


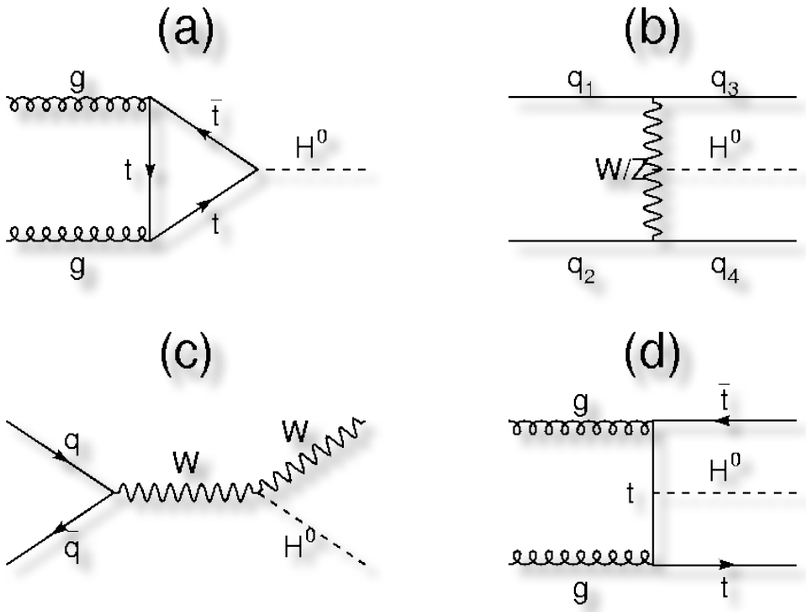
CMS PAS HIG-13-005

	Significance (m_H = 125.7 GeV)		
Combination	**Expected (pre-fit)**	**Expected (post-fit)**	**Observed**
H→ZZ	7.1 σ	7.1 σ	6.7 σ
H→γγ	4.2 σ	3.9 σ	3.2 σ
H→WW	5.6 σ	5.3 σ	3.9 σ
H→bb	2.1 σ	2.2 σ	2.0 σ
H→ττ	2.7 σ	2.6 σ	2.8 σ
H→ττ and H→bb	3.5 σ	3.4 σ	3.4 σ

Higgs Boson Production

- The following four mechanisms can be tested at the LHC and the Tevatron:
  - (a) gluon fusion (19 pb @ 8 TeV)
  - (b) VBF (WW or ZZ fusion)
  - (c) Associated production (VH)
  - (d) ttH production

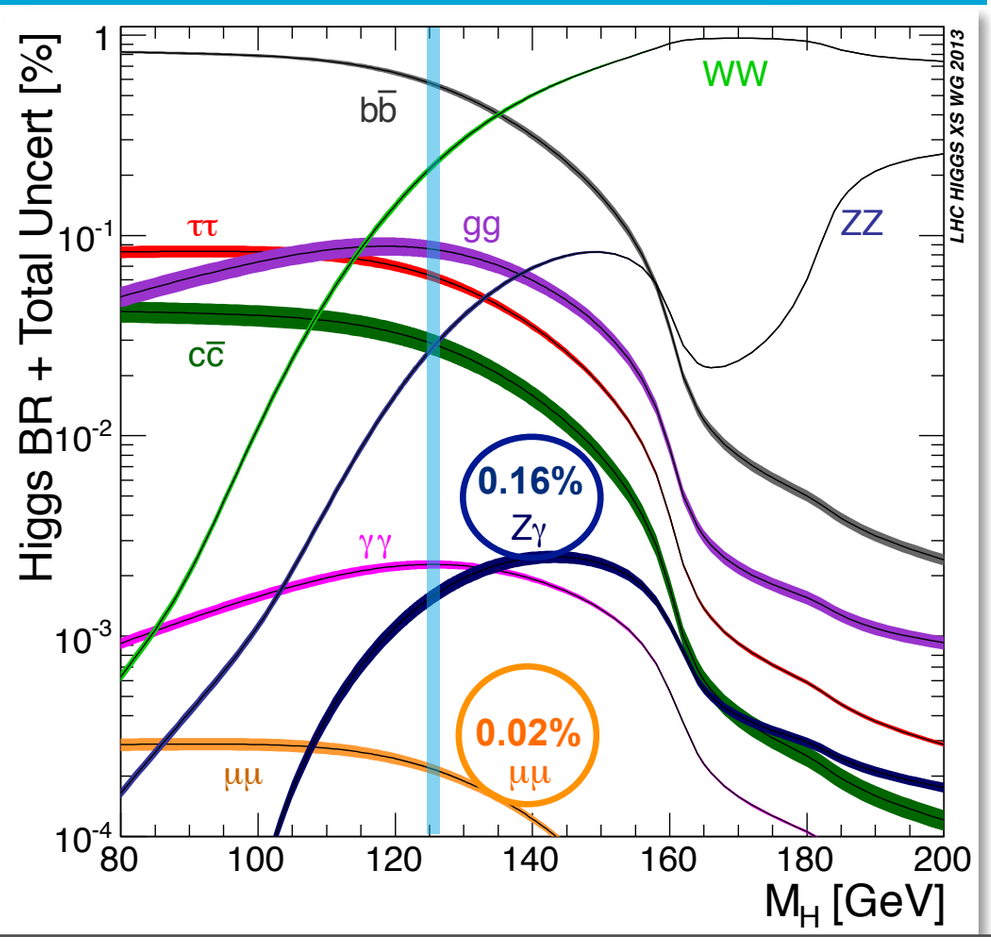




- De nombreuses manières de le produire et de le laisser se désintégrer

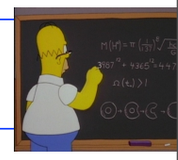
Higgs Boson Decays

- The Nature has chosen the Higgs boson mass (~125.5 GeV) maximally rich, but quite challenging experimentally
- The "big five":
  - H(bb) - 57%
  - H(WW) - 22%
  - H(ττ) - 6.2%
  - H(ZZ) - 2.8%
  - H(γγ) - 0.23%

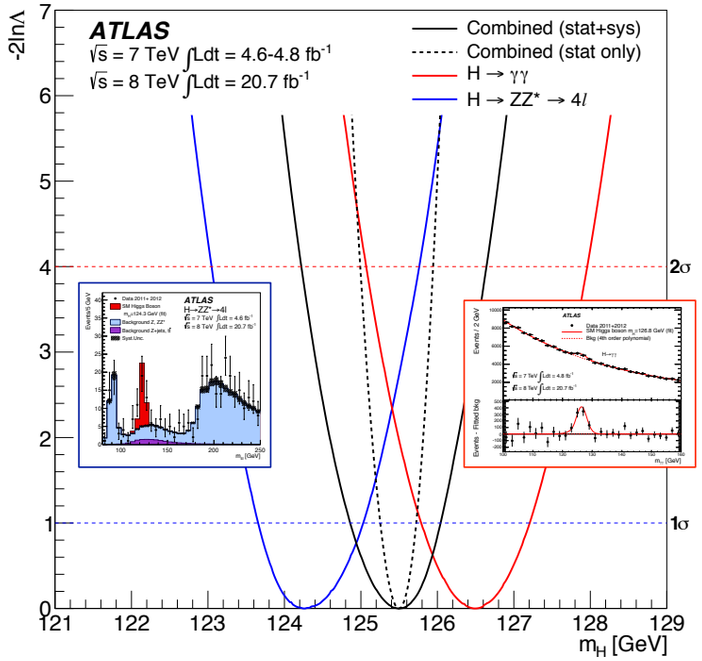


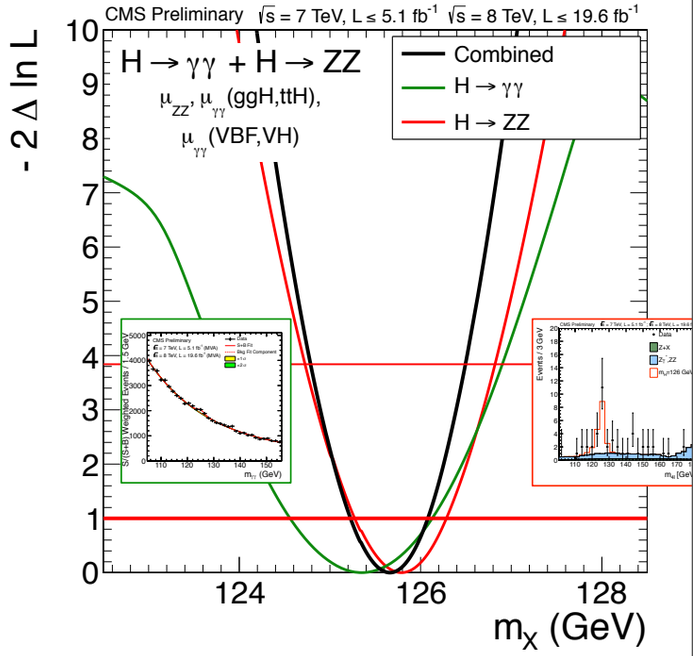
- Masse : toutes les déterminations ne sont pas en parfait accord
- Tester spin et parité : 0−,1+, 1−,2+ alternatives défavorisées par rapport au Modèle Standard (0+)

Mass Measurement



Measured from γγ and ZZ*(4ℓ) mass spectra: needed to predict σ×BR





ATLAS: $M_H = 125.5 \pm 0.2_{stat} \pm 0.6_{sys}$ GeV

CMS: $M_H = 125.7 \pm 0.3_{stat} \pm 0.3_{sys}$ GeV

New From γγ: Γ_H<6.9 GeV at 95% CL (direct)

**Independent of signal strengths: used by ATLAS and CMS coupling/spin analyses*

Spin-Parity ATLAS - CMS Ov

CMS ZZ*(4ℓ)

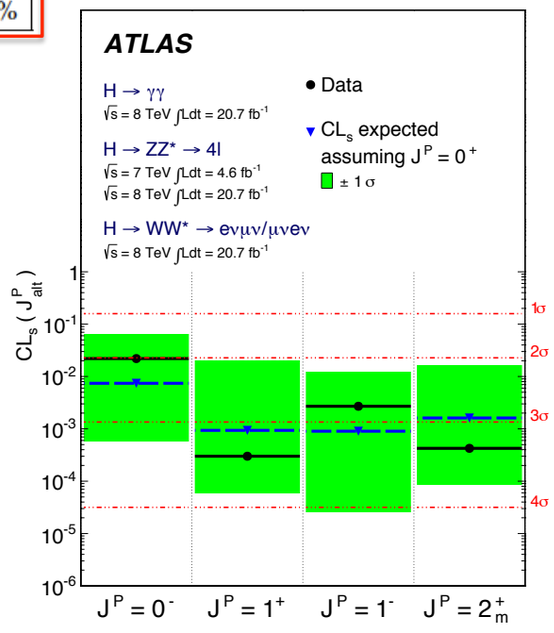
J^P	production	comment	expect (μ=1)	obs. 0^+	obs. J^P	CL_s
0^-	$gg \to X$	pseudoscalar	2.6σ (2.8σ)	0.5σ	3.3σ	0.16%
0_h^+	$gg \to X$	higher dim operators	1.7σ (1.8σ)	0.0σ	1.7σ	8.1%
2^+_{mgg}	$gg \to X$	minimal couplings	1.8σ (1.9σ)	0.8σ	2.7σ	1.5%
$2^+_{mq\bar{q}}$	$q\bar{q} \to X$	minimal couplings	1.7σ (1.9σ)	1.8σ	4.0σ	<0.1%
1^-	$q\bar{q} \to X$	exotic vector	2.8σ (3.1σ)	1.4σ	$>4.0\sigma$	<0.1%
1^+	$q\bar{q} \to X$	exotic pseudovector	2.3σ (2.6σ)	1.7σ	$>4.0\sigma$	<0.1%

ATLAS and CMS: *"bosonic"* decay modes

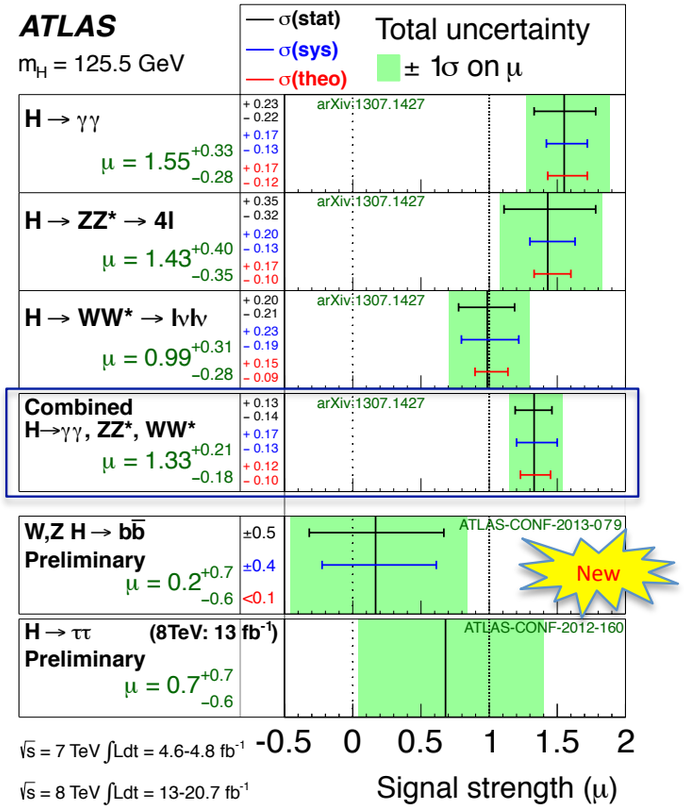
Strongly favor $J^P = 0^+$ SM quantum numbers

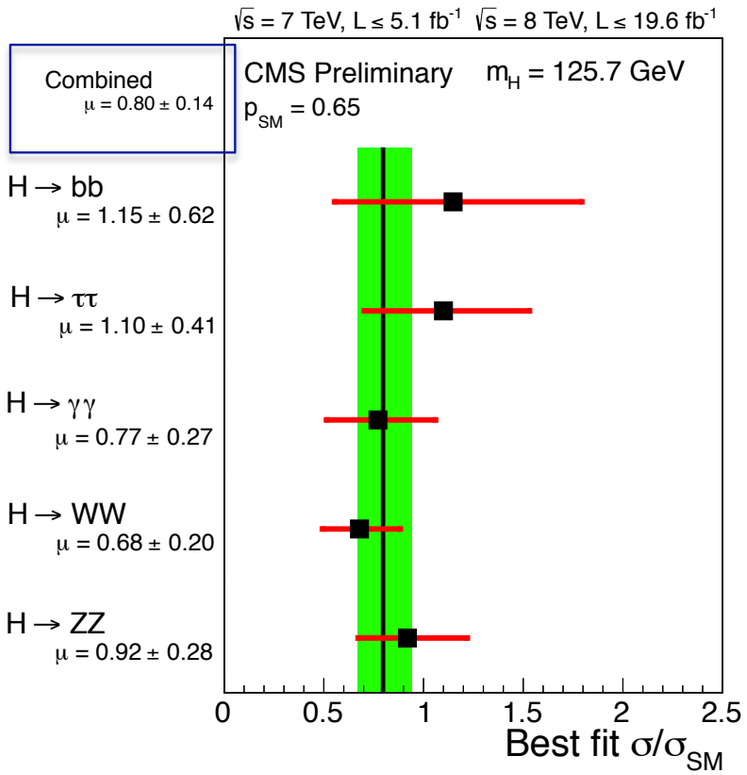
All alternative J^P models tested:

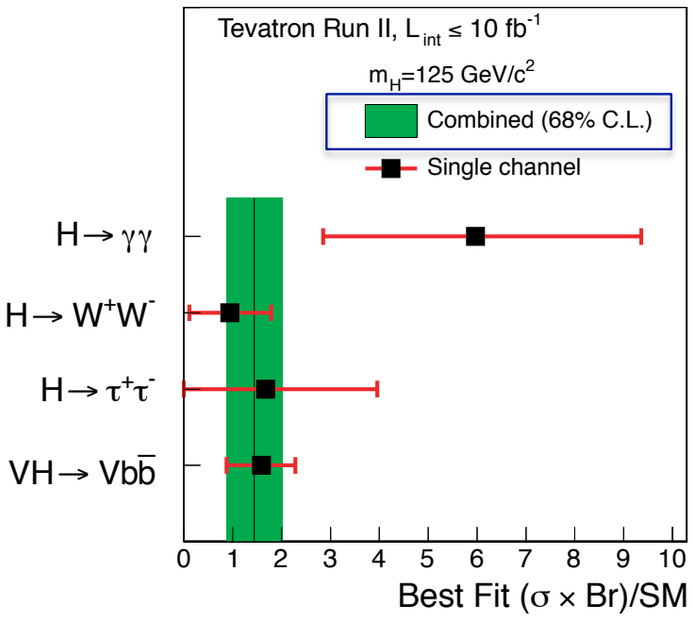
Excluded @ >95% CL



The signal Strength μ







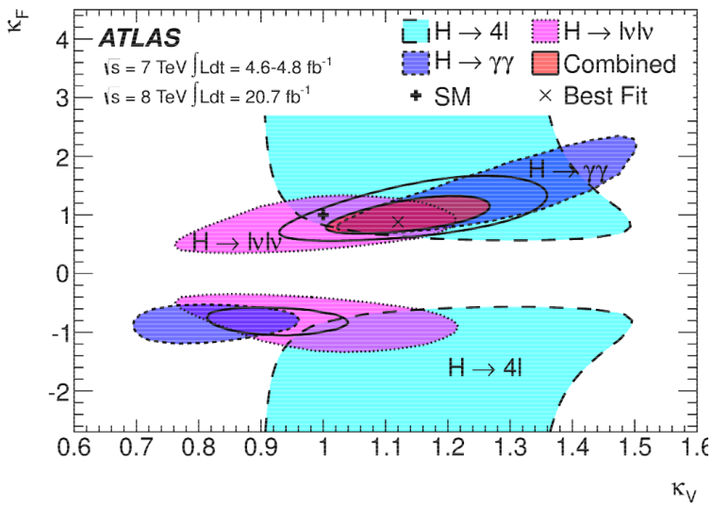
- Combined μ → Best accuracy but no strong physics motivation:
  - **ATLAS (γγ, WW* and ZZ*)** **μ = (1.33 ± 0.20)** (1.23±0.18 including bb and ττ)
  - **CMS (γγ, ττ, bb, WW* and ZZ*)** **μ = (0.80 ± 0.14)**
  - **TEVATRON (bb, γγ, ττ, WW*)** **μ = (1.44 ± 0.60)**

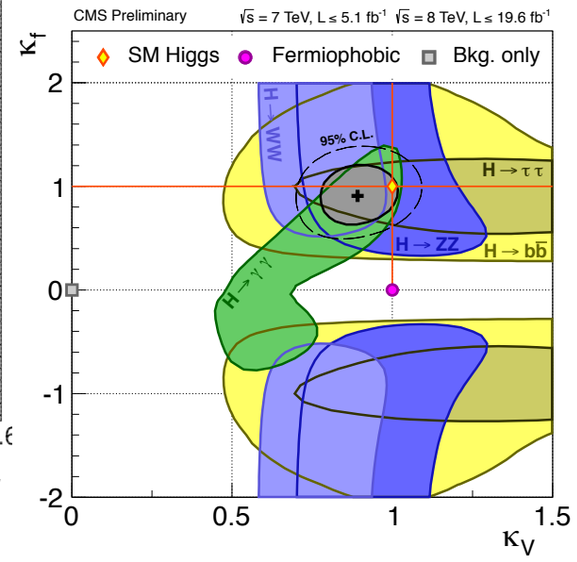
Compatible with SM Higgs boson expectation: Accuracy ~ 15%

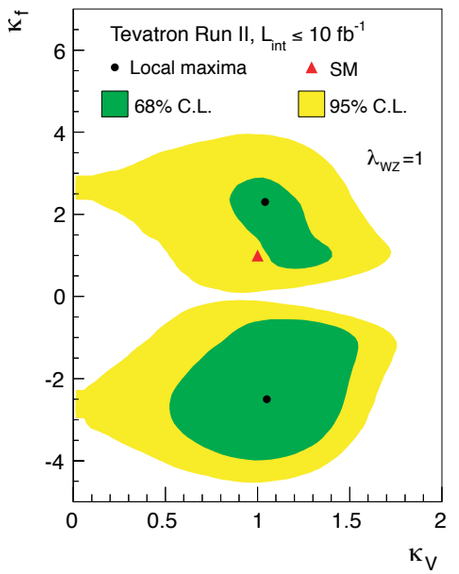
- Nouveaux résultats pour H->b bbar, H-> tau tau (MS OK)
- Cherche H->Zgamma, H->mu mu, couplage ttH

Test of Vector vs Fermion sectors κ_V-κ_F

- *Assumptions:*
  - All Fermion couplings scale as κ_F ($=\kappa_t=\kappa_b=\kappa_\tau=\ldots$)
  - All Vector Boson couplings scale as κ_V ($=\kappa_W=\kappa_Z$)
  - No BSM contributions to $\Gamma_H \rightarrow \kappa^2_H(\kappa_F\,\kappa_V) \sim 0.7\,\kappa^2_F + 0.3\,\kappa^2_V$ and $\kappa_g(\kappa_F\,\kappa_V)$ $\kappa_\gamma(\kappa_F\,\kappa_V)$

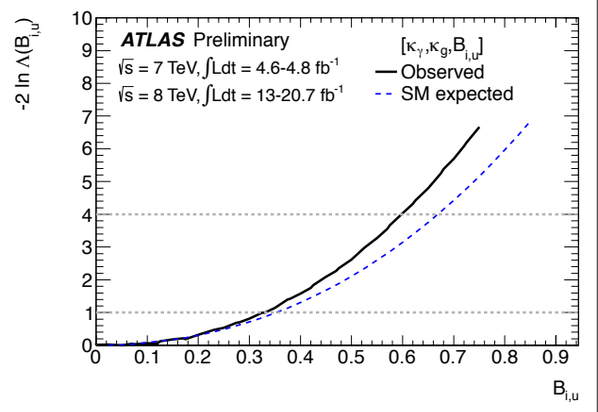






- **All experiments compatible with SM predictions: accuracy ~10-20%**
  - **ATLAS: κ_V [1.05,1.22] at 68% CL - κ_F [0.76,1.18] at 68% CL**
  - **CMS: κ_V [0.74,1.06] at 95% CL - κ_F [0.61,1.33] at 95% CL**
- **κ_F=0 Excluded at >5σ** (mainly indirect via gg loop)

on BR_{BSM}



…tectable

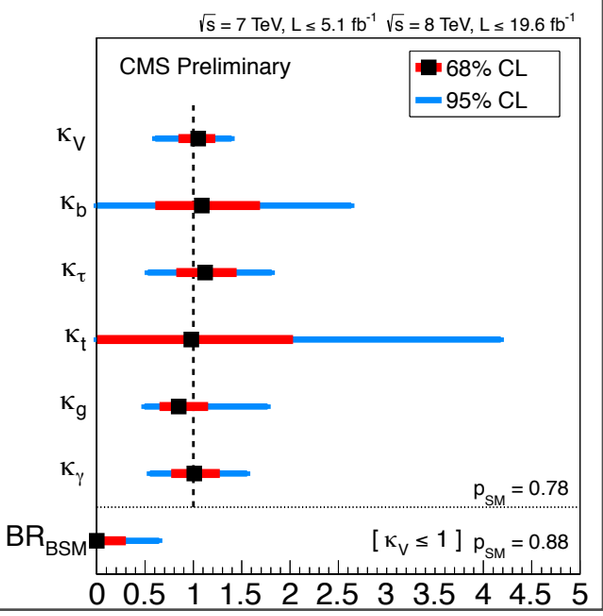
- Higgs comme test MS: Couplage du Higgs aux particules du Modèle Standard
- Br(BSM) : désintégrations du Higgs dans quelque chose autre que MS (non détecté)

ATLAS:

- *Assumptions* three-level couplings: $\kappa_b=\kappa_W$ ..= 1
- 3 Fitted Par.: $\kappa_\gamma\,\kappa_g$ + BR_{BSM}
- **BR_{BSM} < 0.60 @ 95% CL** (0.67 exp.)

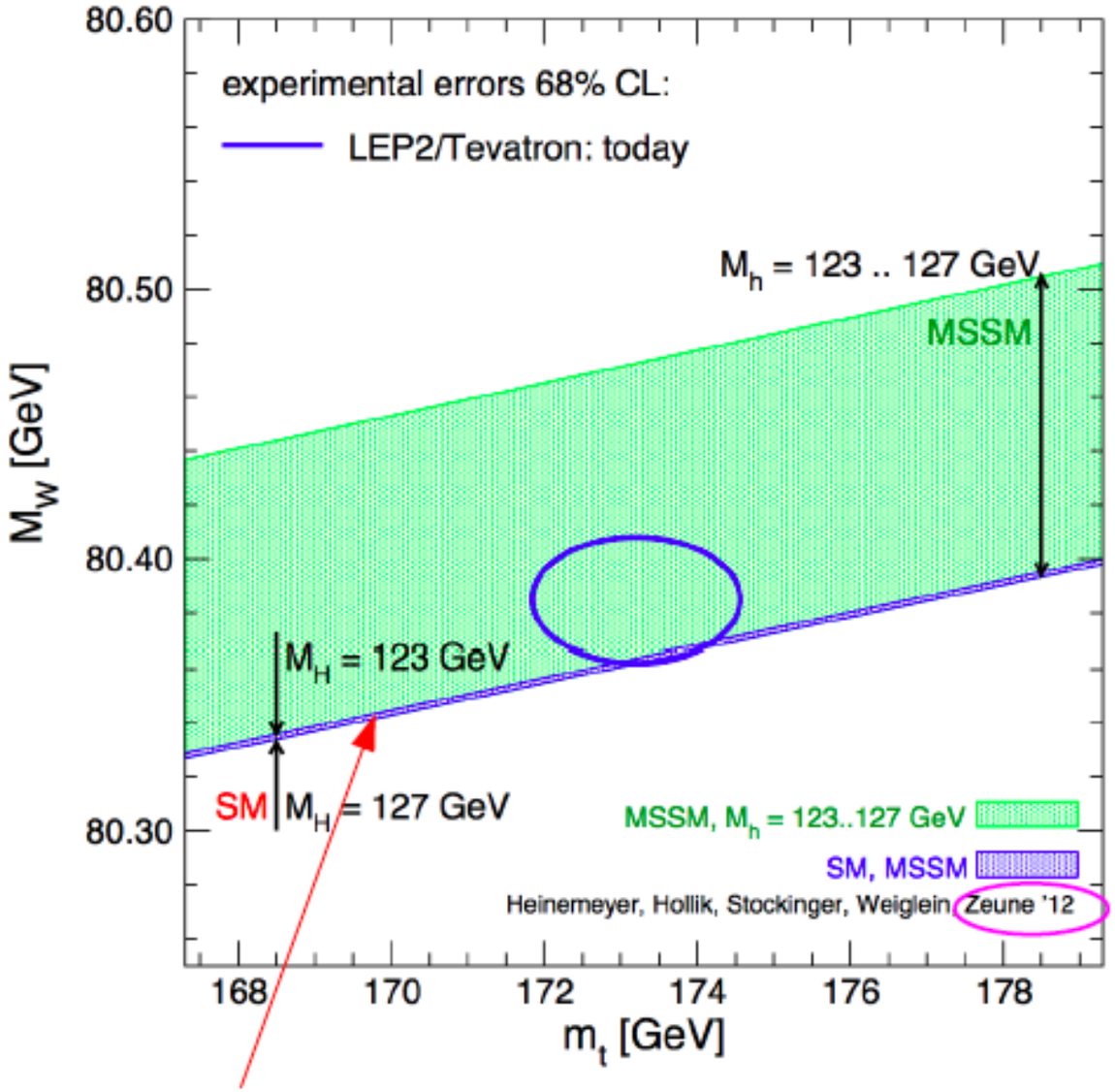
CMS:

- *Assumption*: $\kappa_V \le 1$ (motivated by EWSB)
- 7 Fitted Par.: $\kappa_V\ \kappa_b\ \kappa_\tau\ \kappa_t\ \kappa_\gamma\ \kappa_g$ + BR_{BSM}
- **BR_{BSM} < 0.64 @ 95% CL** (0.66 exp.)



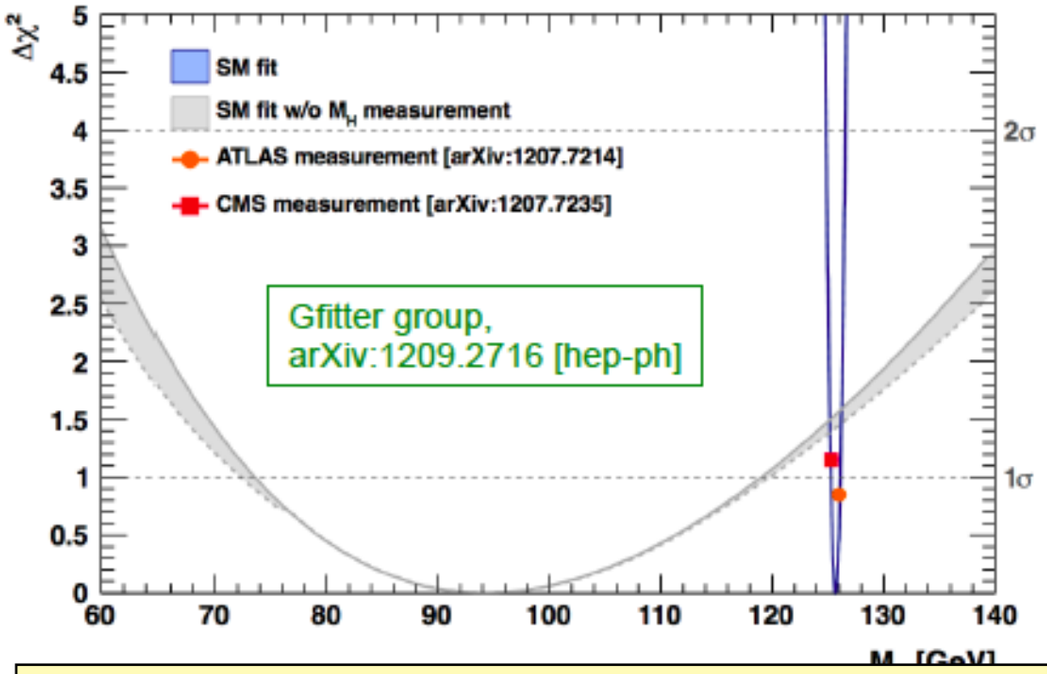
Higgs, mais aussi top, W, Z... et les autres

W boson mass



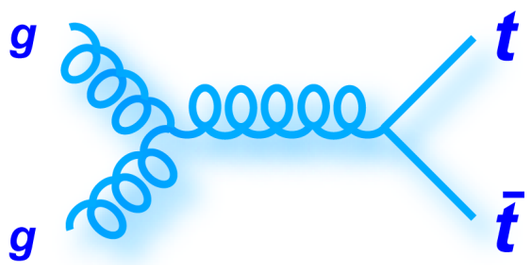
In the context of the standard model, the mass of the new boson discovered by ATLAS+CMS is inside this blue band.

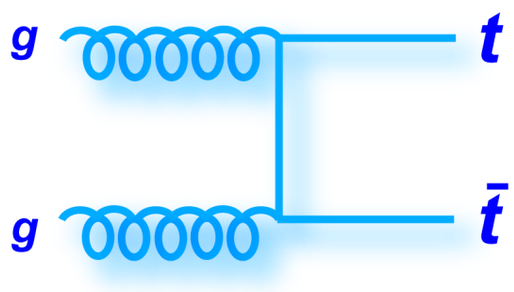
Comparison of indirect constraints on the Standard Model Higgs boson and the direct measurements of the mass of the new boson discovered by ATLAS and CMS:

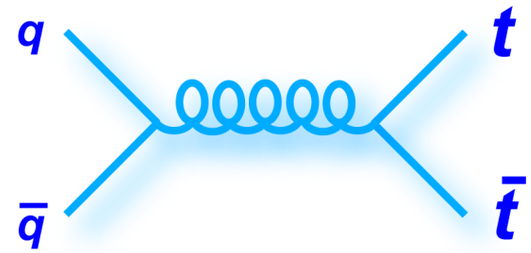


- On affine notre connaissance des propriétés des particules déjà connues (W, Z...)

- Top pair production (through strong interaction):





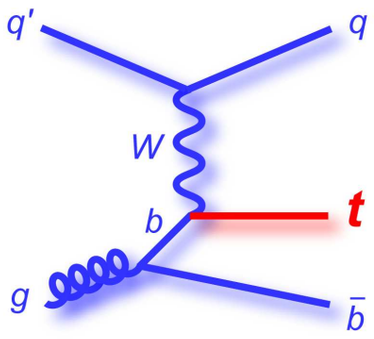


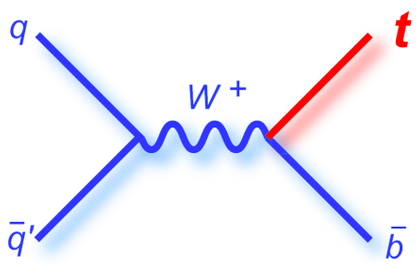
$\sim$ 85% at LHC

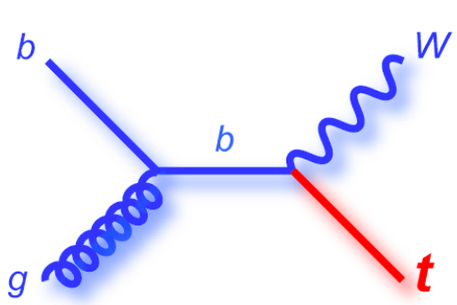
$\sim$ 85% at Tevatron

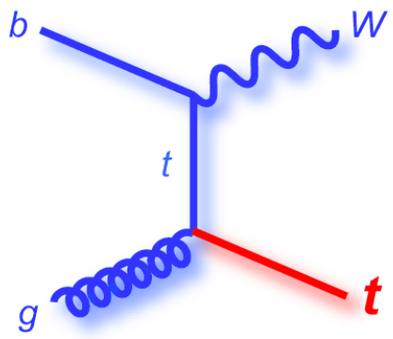
$\sim$ 7 pb @ Tevatron, $\sim$ 170 pb @ LHC 7TeV.

- Single top production (through electroweak interaction):









t-channel

2 pb @ Tevatron

65 pb @ LHC 7TeV

s-channel

1 pb @ Tevatron

5 pb @ LHC 7TeV

Wt-channel

0.3 pb @ Tevatron

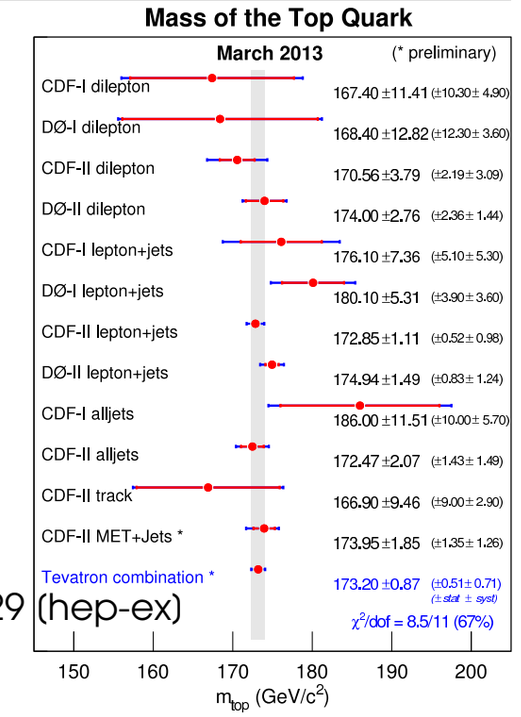
16 pb @ LHC 7TeV

Top Quark Mass

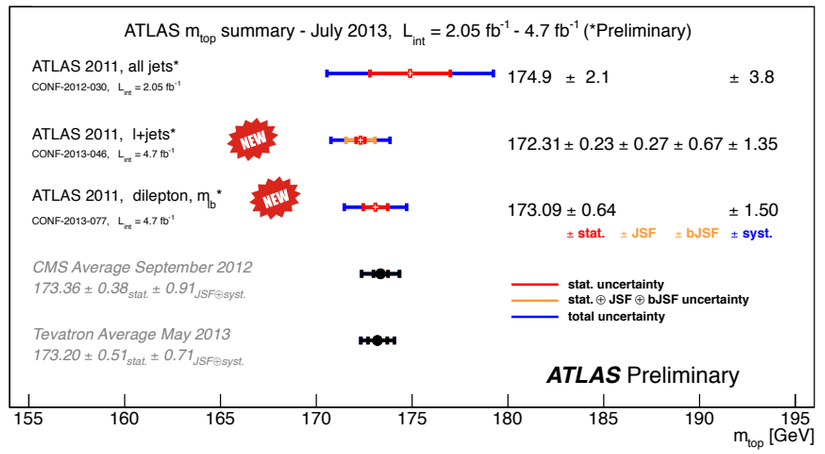
- On teste beaucoup le top actuellement (déjà à Fermilab, mais plus encore au LHC)
- Masses, couplage au W

- Tevatron still provides the best mass measurement, with an uncertainty of 0.5%.
- Best single LHC measurement (from CMS) reaches 0.6%.
- Updated LHC mass combination in progress.

→ Harmonise systematic treatment e.g. generator modeling.



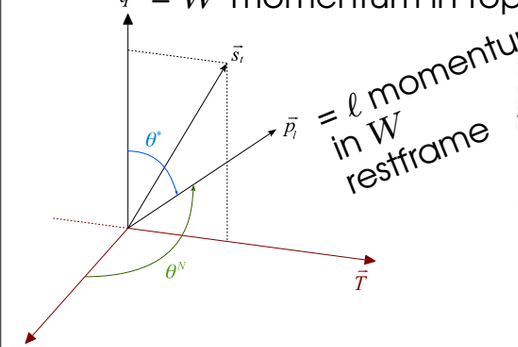
arXiv:1305.3929 (hep-ex)



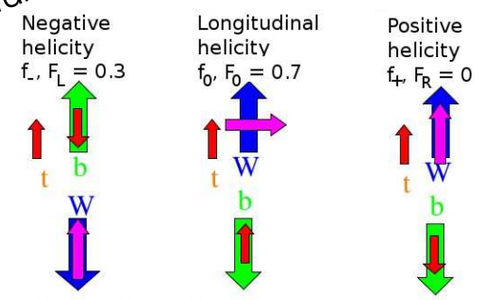
W Helicity Fractions in Top Quark Decays

- Probes (V-A) structure of Wtb vertex.

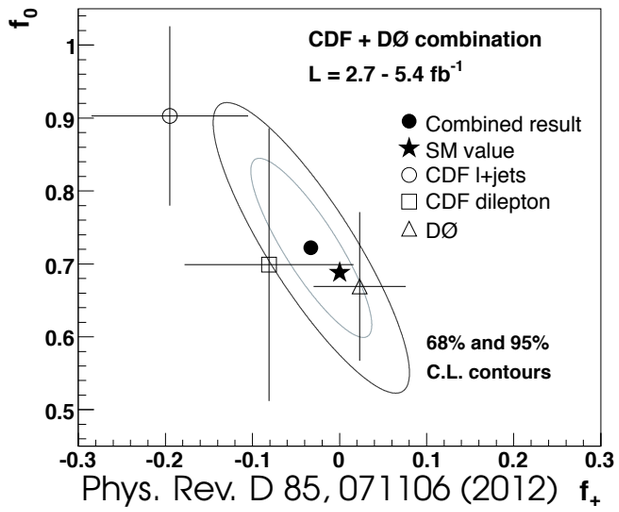
$\vec{q}$ = W momentum in top restframe



= ℓ momentum in W restframe



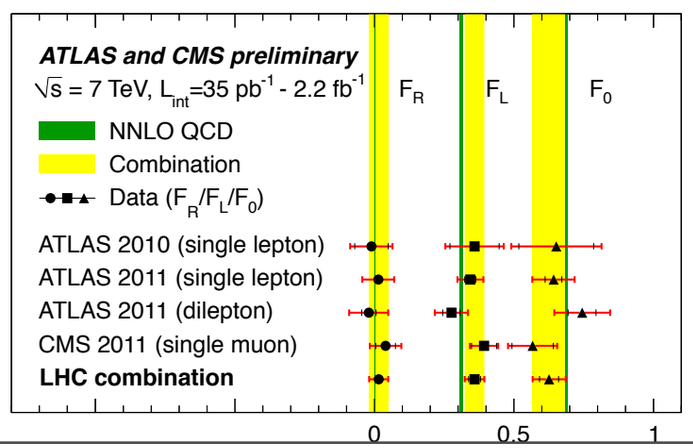
$\vec{N} = \vec{s}_t \times \vec{q}$, with $\vec{s}_t$ = top polarization direction



Phys. Rev. D 85, 071106 (2012)

- Extract helicity fractions from:
  - $\theta^\star$ in $t\bar{t}$ events (unpolarized).
  - e.g. θ^N in single top events (polarized).
- Not yet in LHC combination:
  - latest single lepton and dilepton measurements (CMS-TOP-11-020, CMS-PAS-TOP-12-015). NEW
  - first measurement in single top

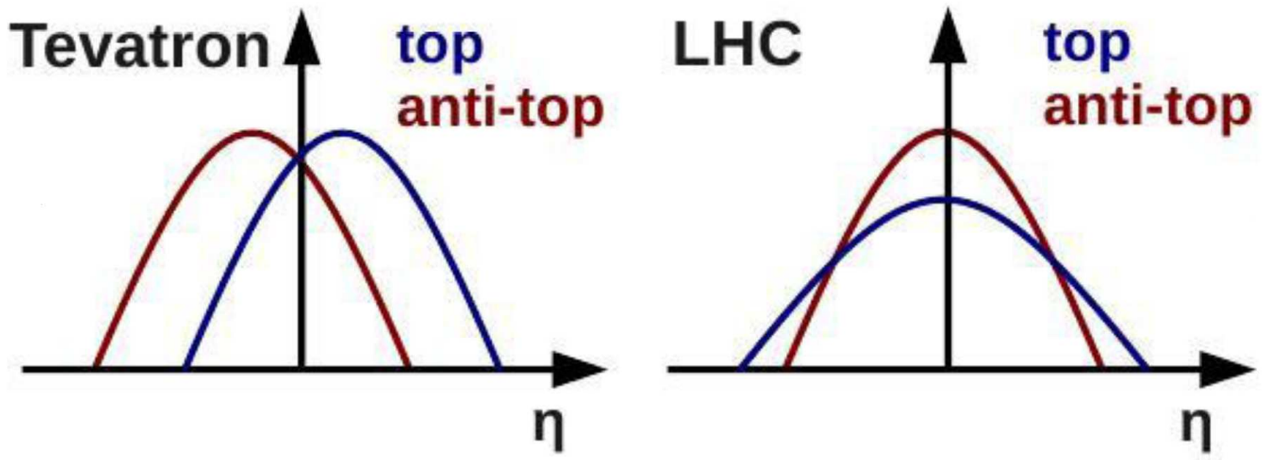
ATLAS-CONF-2013-033, CMS-PAS-TOP-12-025

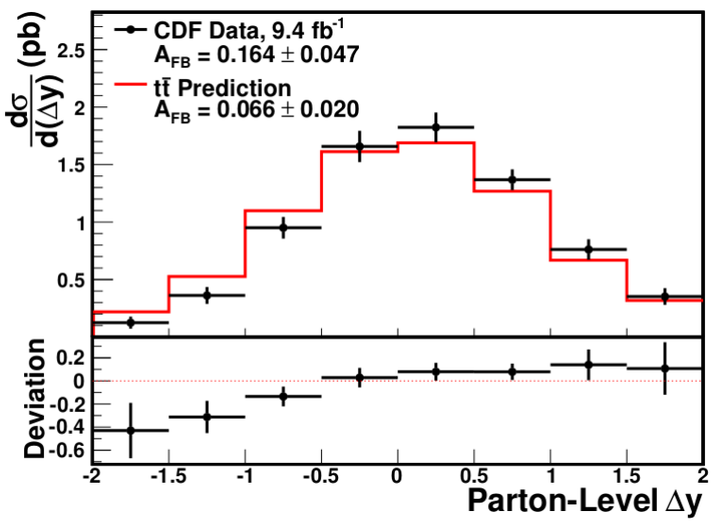


Top Forward-Backward and Charge Asymmetries

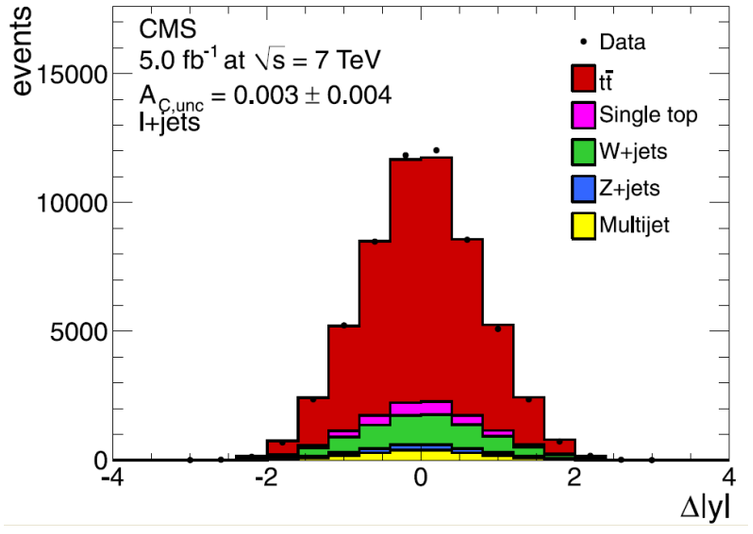
- New physics in top sector can alter angular distributions.
- Study forward-backward and charge asymmetries.

- La production de top-antitop: OK au LHC, mais pas au Tevatron ???

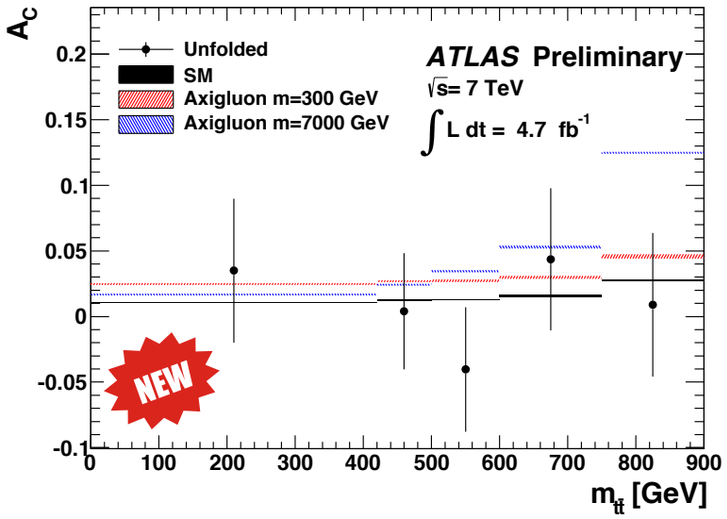




Phys. Rev. D 87 092002 (2013)



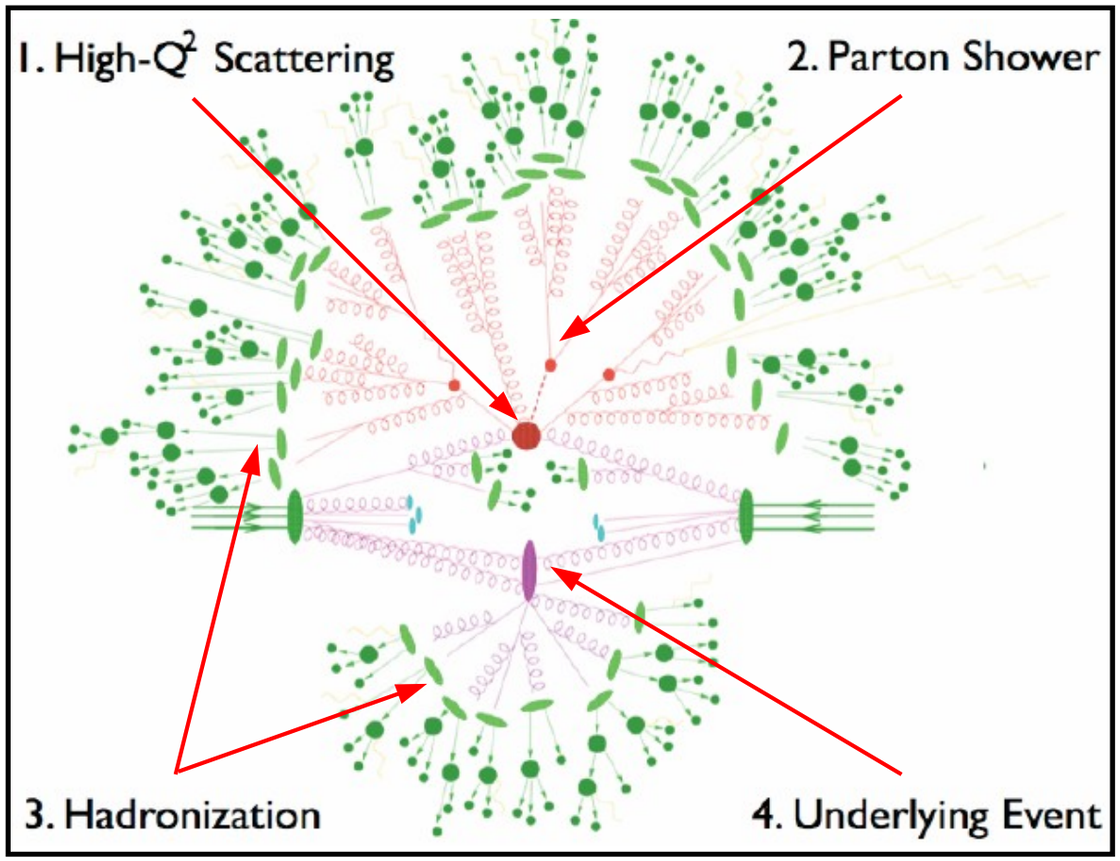
Phys. Lett. B 717, 129 (2012)



ATLAS-CONF-2013-078

- Tevatron $A_{FB}^{t\bar{t}}$ measurements in tension with SM at $\sim 2.5\sigma$.
- LHC $A_C^{t\bar{t}}$ measurements consistent with SM.

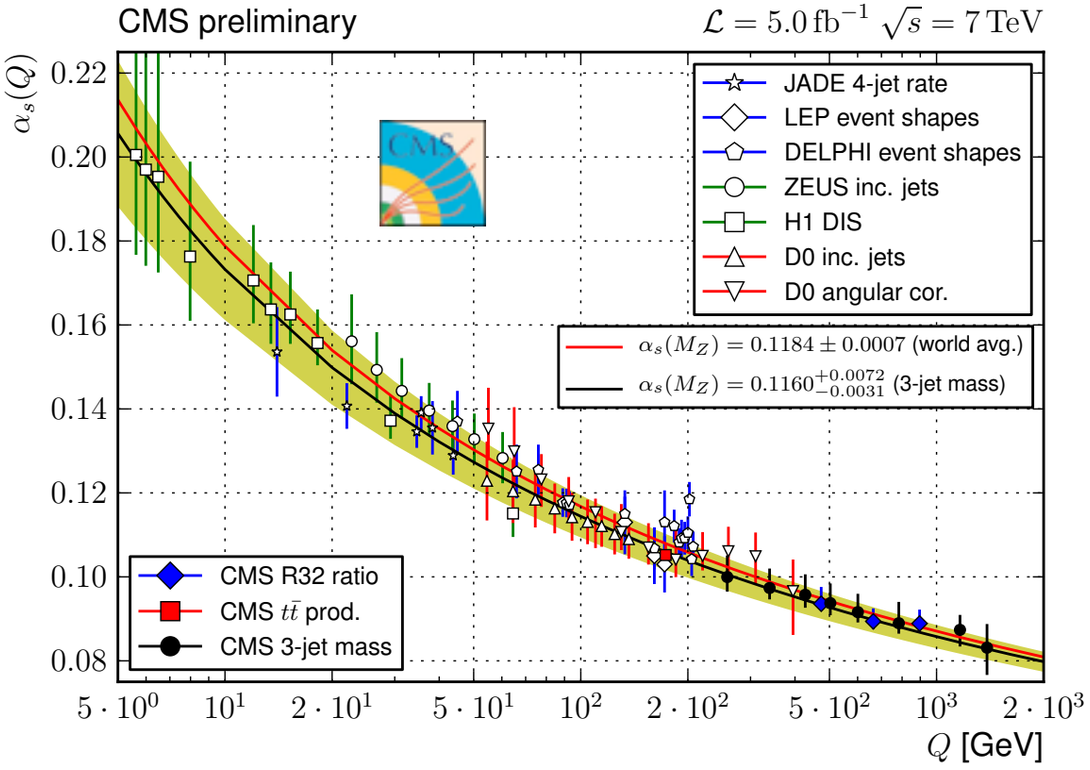
The complexity of QCD

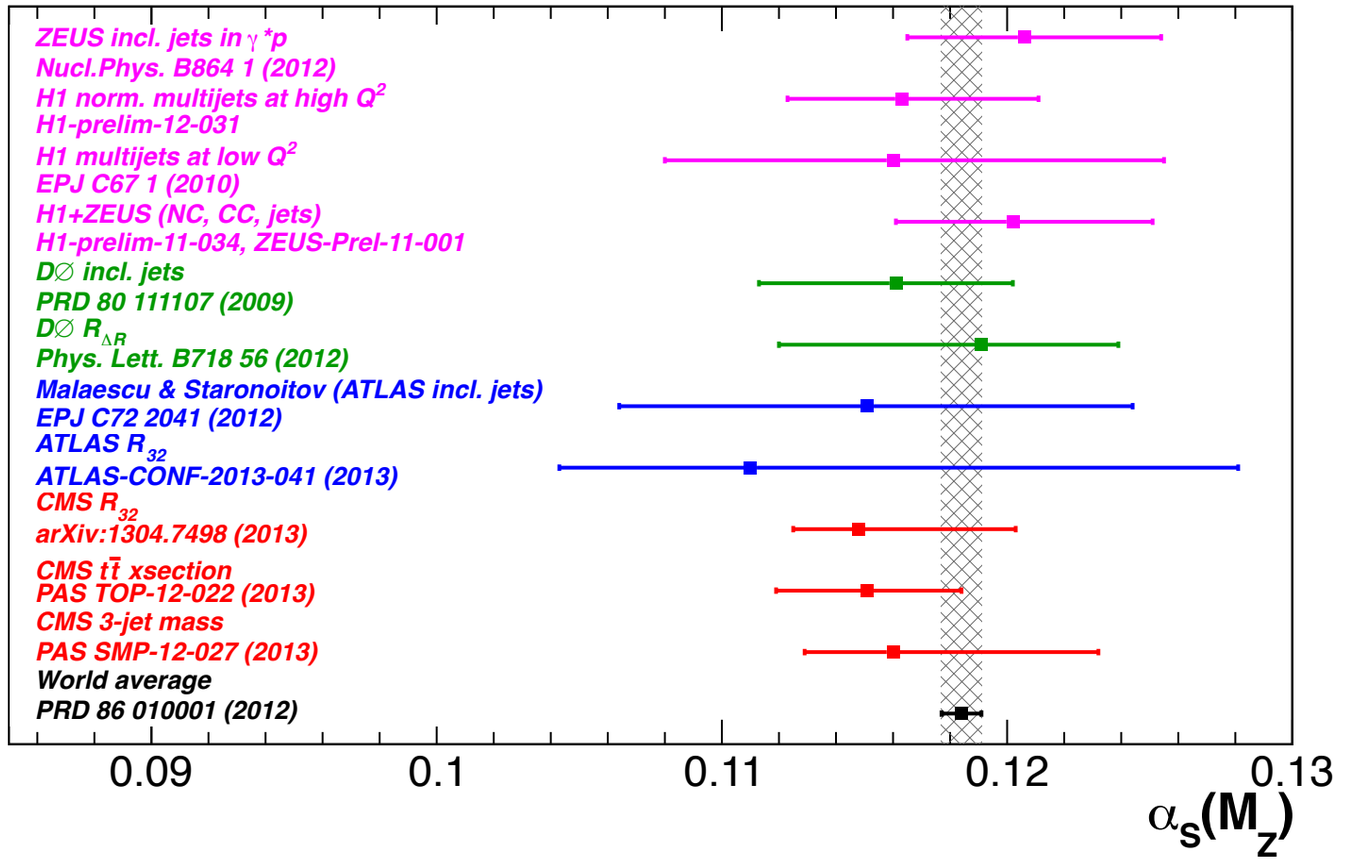


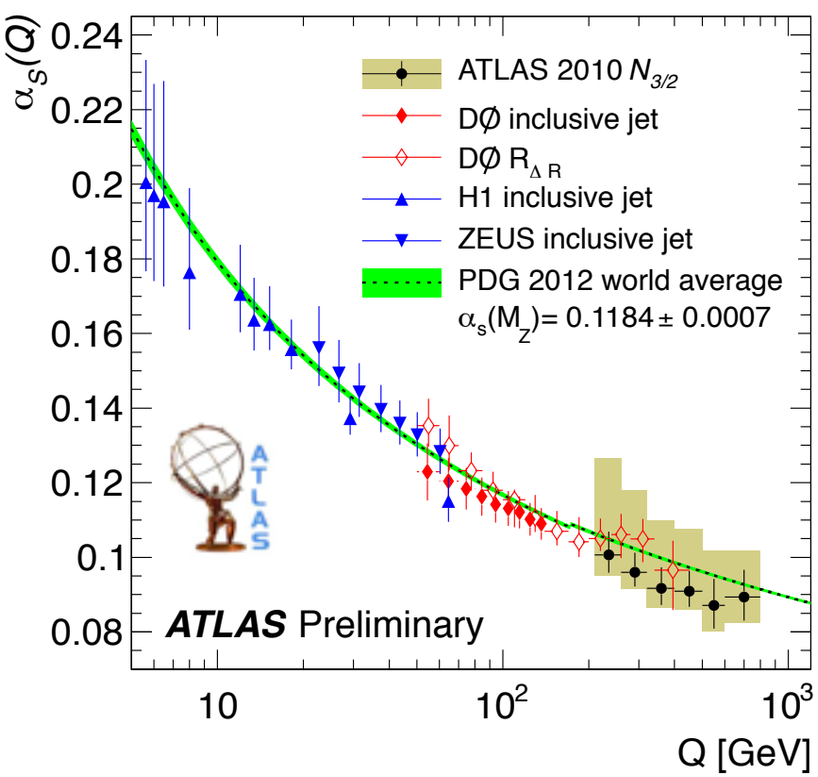
- QCD : un défi au LHC

- QCD events: immensely complicated
  - theoretical predictions very hard
  - experimental challenges
- basic elements of a QCD process
  - structure of the proton
    - ➡ *encapsulated into the universal PDFs*
  - hard scatter
    - ➡ evaluated with perturbation theory
  - parton shower & hadronization
  - multiple parton scattering & underlying event activity
    - ➡ approximated by Monte-Carlo programs with few tunable parameters
- practical QCD: the elements above can be factorized and combined at the end
  - reasonable approximation for hard enough processes

Measurements of α_s







- Le LHC commence à mesurer la constante de couplage forte !

- enough LHC data to exploit phase-space regions with small scale uncertainty (hard 3rd jet)

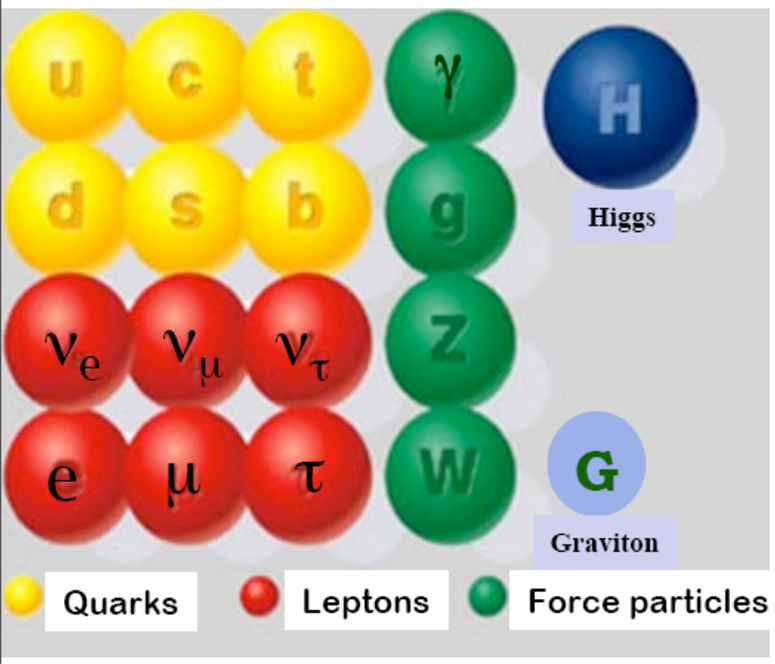
- measurements at different hard scales up to 1.5 TeV confirm the running of the coupling constant

Allo ? La Nouvelle Physique ?

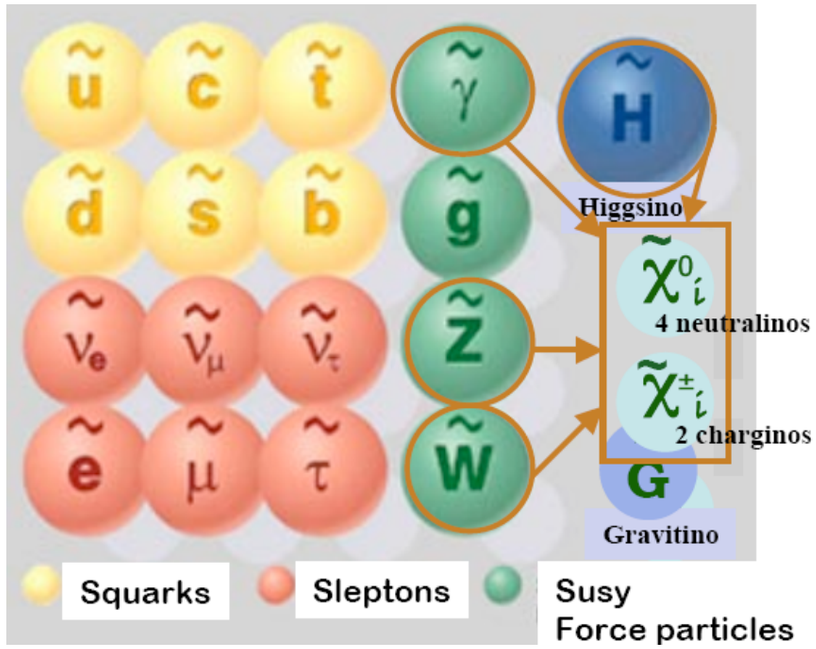
Extension of the Standard Model: Introduce a new symmetry

Spin ½ matter particles (fermions) ⇔ Spin 1 force carriers (bosons)

Standard Model particles



SUSY particles



New Quantum number: R-parity: $R_p = (-1)^{B+L+2s}$ = +1 SM particles, - 1 SUSY particles

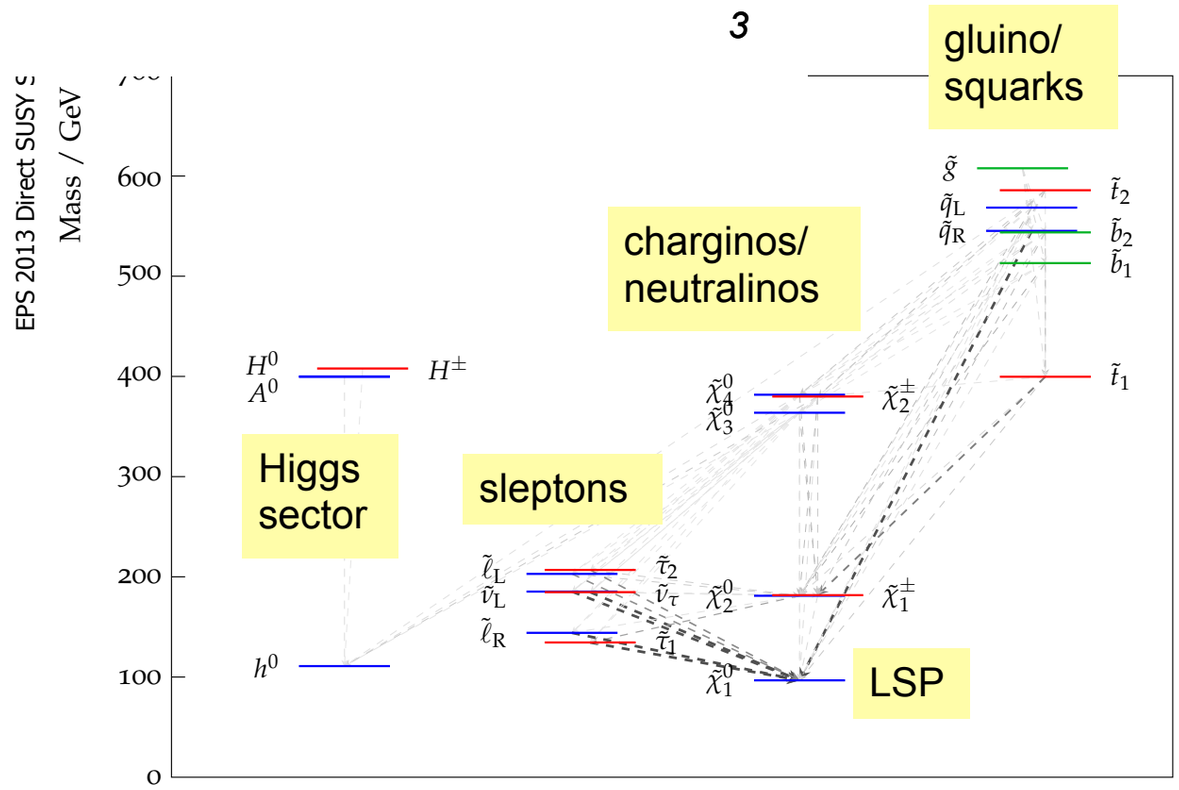
R-parity conservation:

- SUSY particles are produced in pairs
- The lightest SUSY particle (LSP) is stable

- Supersymétrie : toujours la plus étudiée des extensions du Modèle Standard

CMSSM

$m_0, m_{1/2}, \tan\beta, A_0, sign(\mu)$



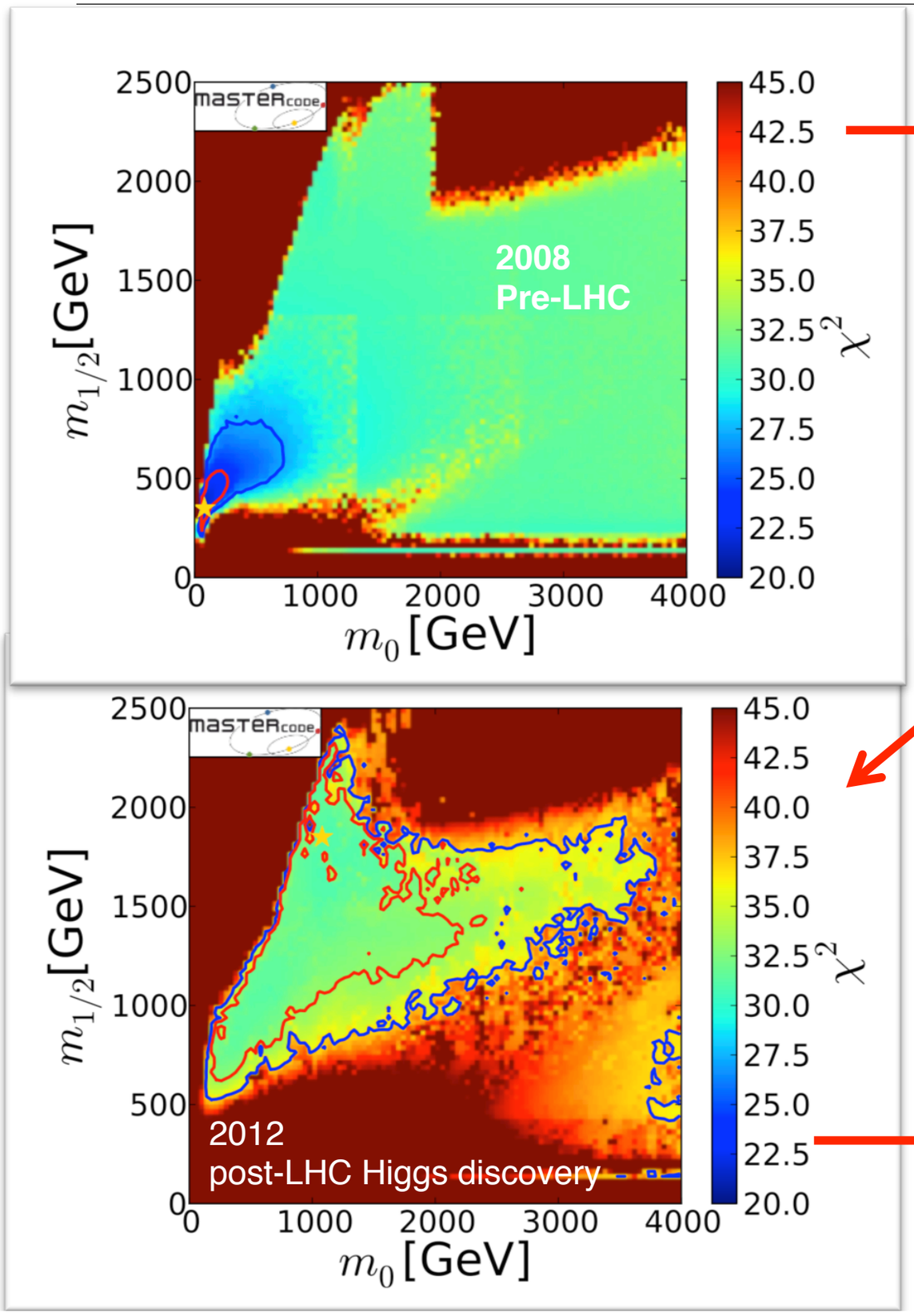
Advantage:

- Only four free parameters (when sign(μ) fixed)
- One of the most studied incarnations of the MSSM

Disadvantage:

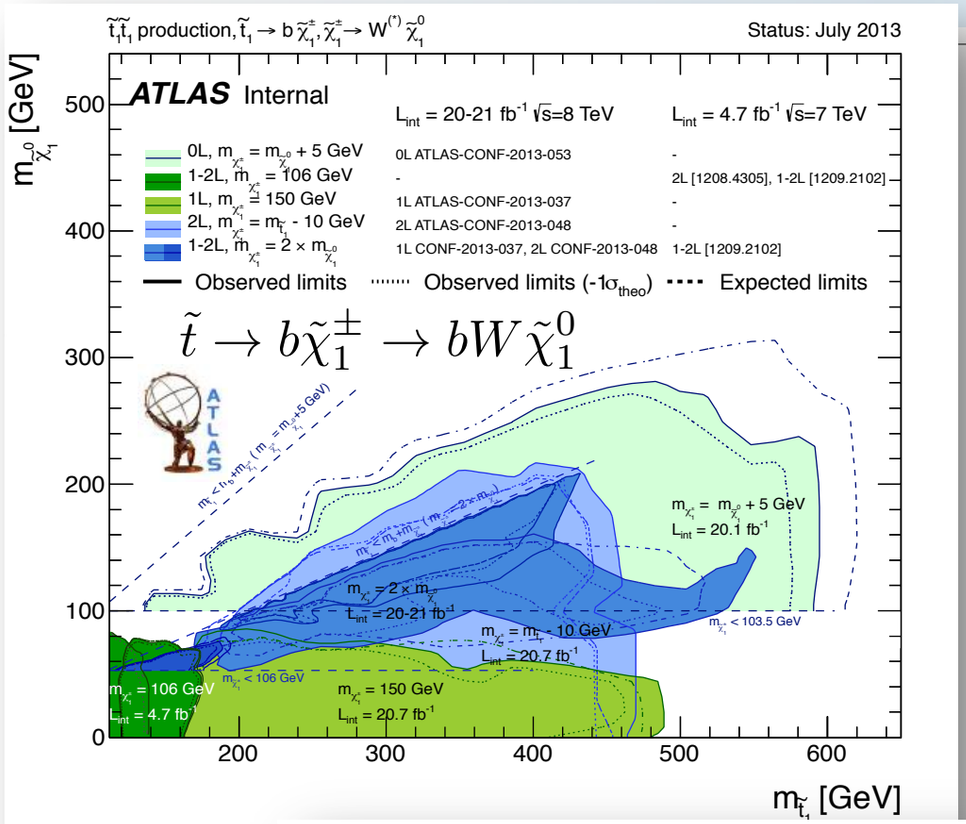
- Not generally representative of SUSY (e.g. fixed mass relation between M_{gluion} and M_{LSP})

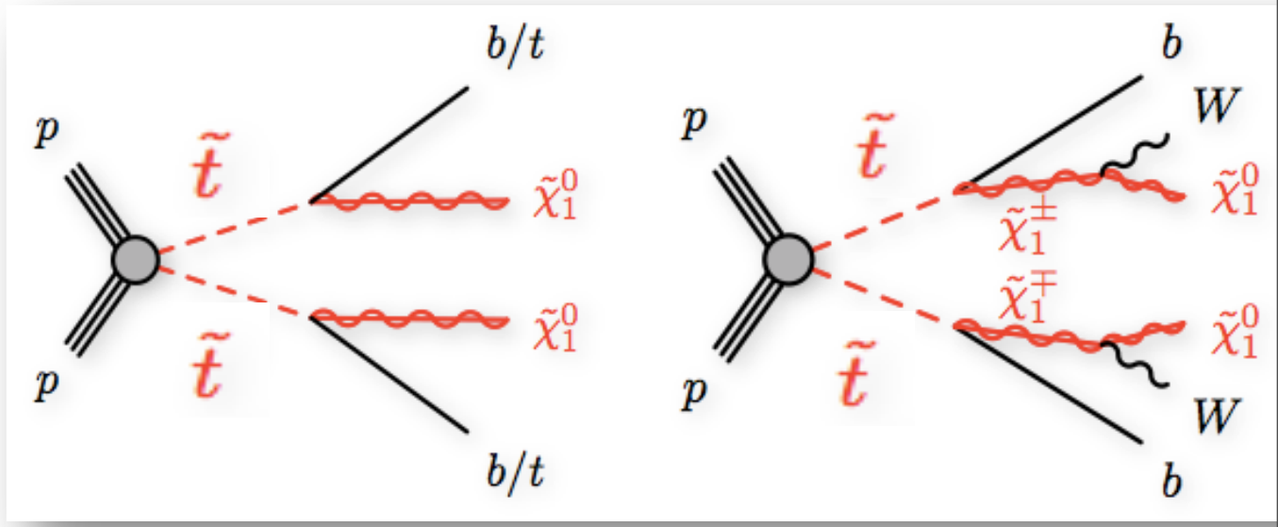
CMSSM: Evolution with time

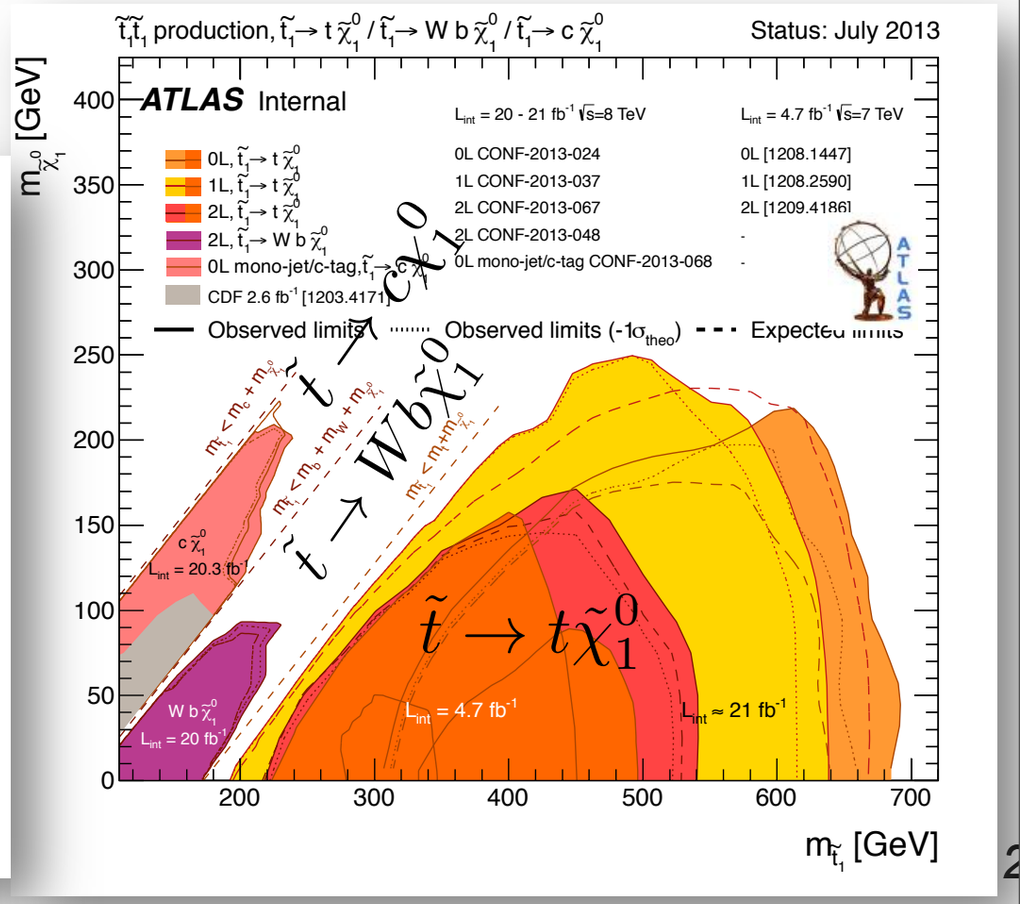


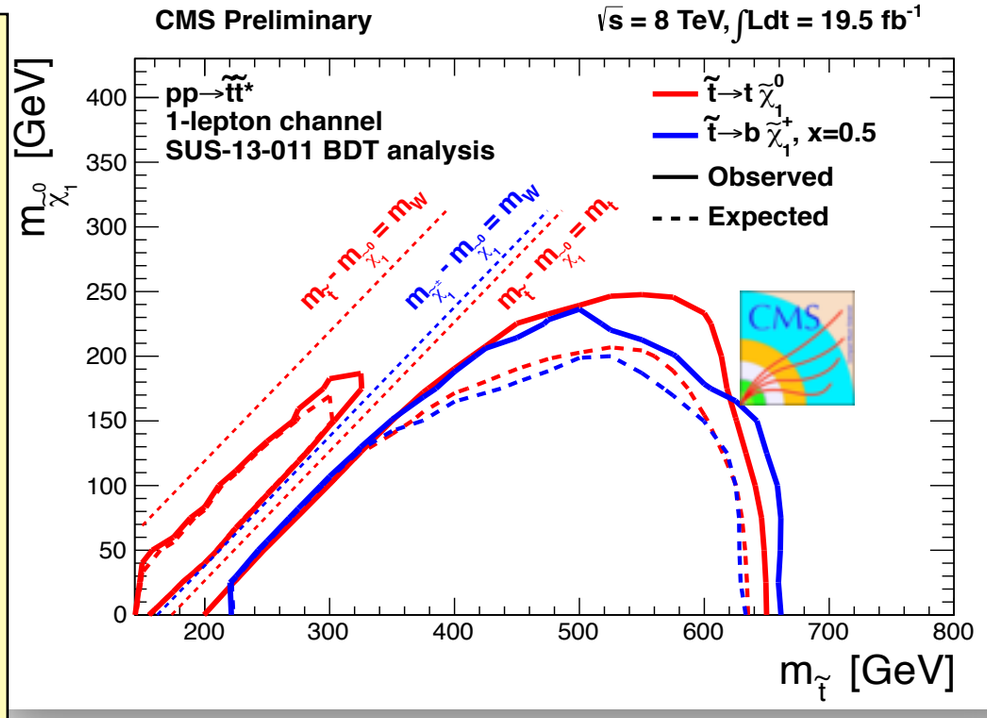
Imperial College London

Dedicated searches for direct stop-pair production



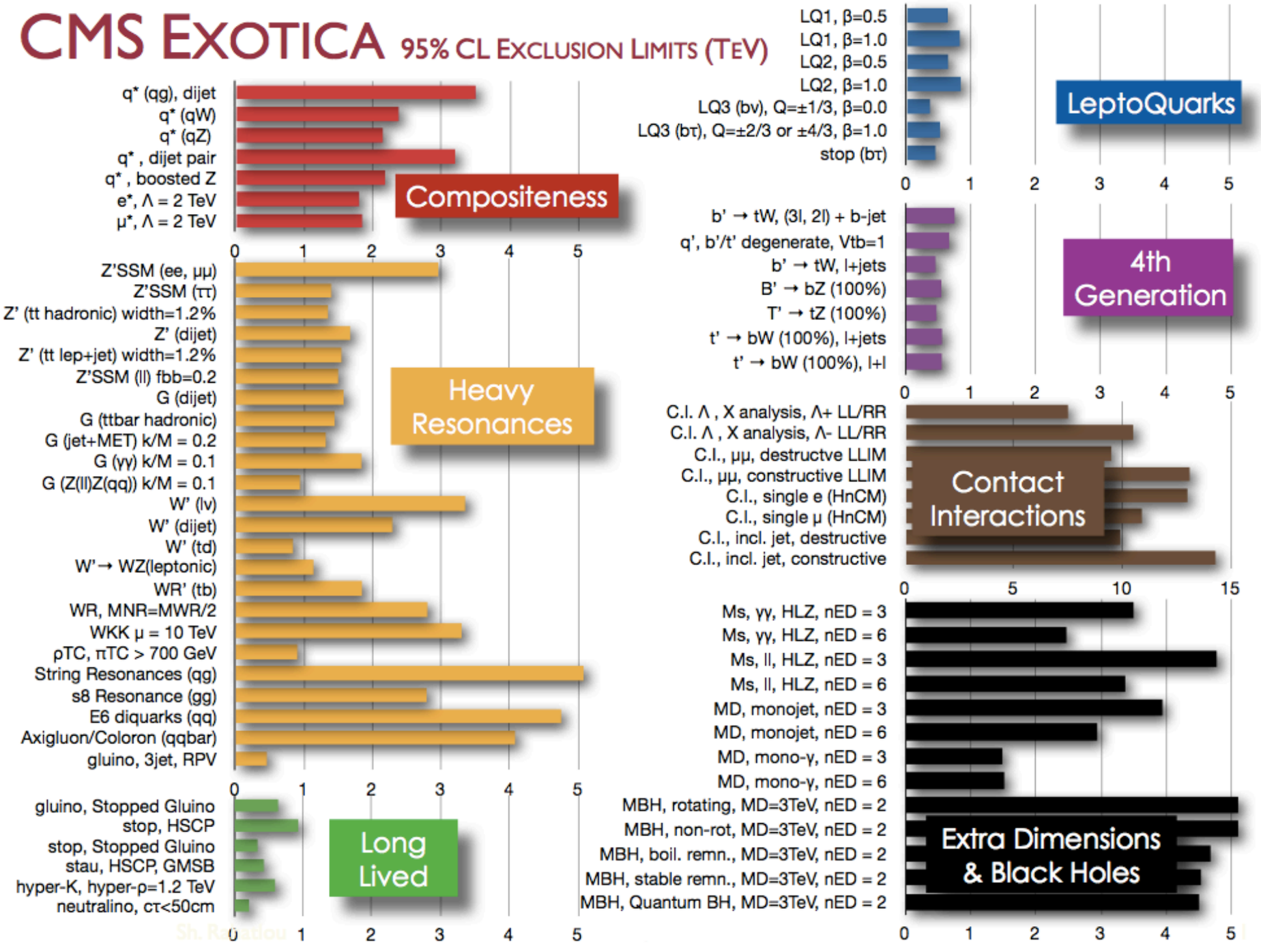






Avec de nombreux canaux possibles, mais non observés, contraignant les paramètres

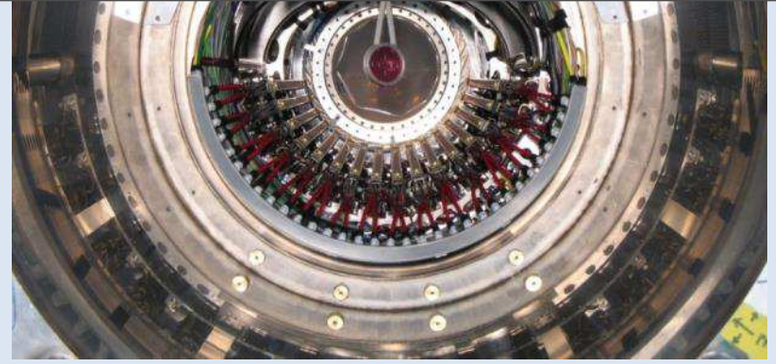
Focus on 8 TeV results

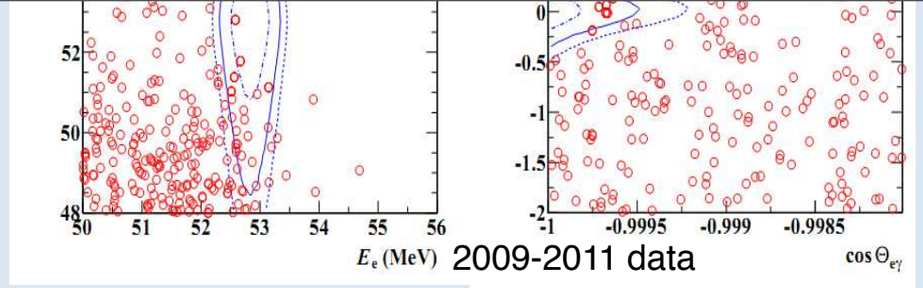


- Il n'y pas que la supersymétrie, et beaucoup d'autres signaux de nouvelle physique sont testés...
- En espérant voir de nouvelles particules après l'augmentation en énergie du LHC...

Sur la piste de la Nouvelle Physique

- A la recherche de processus très supprimés par le Modèle Standard....
- ... qui seraient augmentés par de la Nouvelle Physique





2009-2011 data

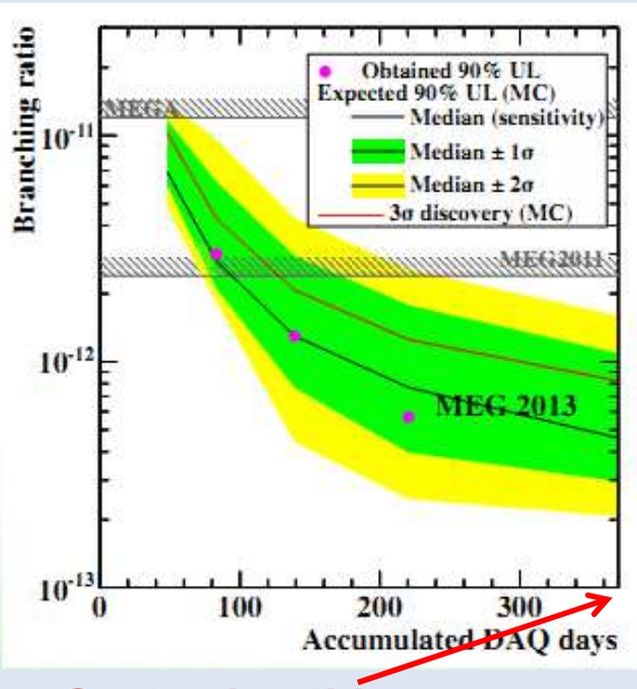
New results ! $< 5.7 \times 10^{-13}$ (90% CL)

PRL 110, 201801 (2013) PHYSICAL REVIEW LETTERS week ending 17 MAY 2013

New Constraint on the Existence of the $\mu^+ \to e^+\gamma$ Decay

TABLE I. Best fit values ($\mathcal{B}_{\rm fit}$'s), branching ratios ($\mathcal{B}_{90}$) and sensitivities ($\mathcal{S}_{90}$).

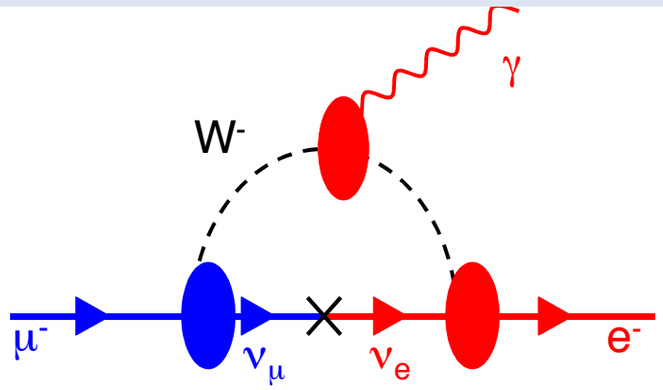
Data set	$\mathcal{B}_{\rm fit} \times 10^{12}$	$\mathcal{B}_{90} \times 10^{12}$	$\mathcal{S}_{90} \times 10^{12}$
2009–2010	0.09	1.3	1.3
2011	−0.35	0.67	1.1
2009–2011	−0.06	0.57	0.77



Courtesy: A. Baldini

End of data taking: September this year

- Only known LFV so far: neutrino mixing
- Suppressed by $(\delta m_\nu/m_W)^4$ and thus smaller than 10^{-50}
  → SM not observable
- Plenty of room for new physics



Expect from SM:

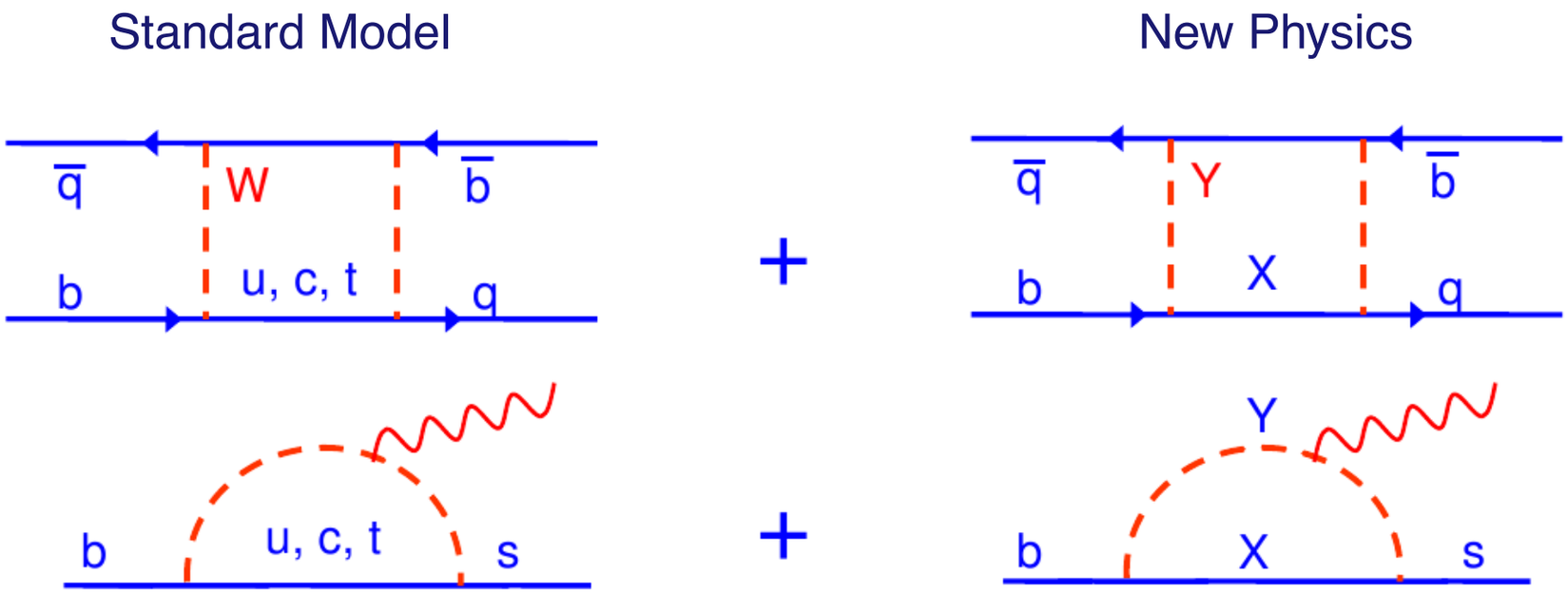
BR(μ-eγ) < 10^{-50}
Experimentally so far:

< 5.7×10^{-13}

- Beaucoup d'activité sur les processus ultrarares changeant la saveur leptonique, et sur les moments électriques dipolaires (électron, neutron, atomes...)

Search for New Physics in the Flavour Sector

New Physics are corrections to Standard Model processes:

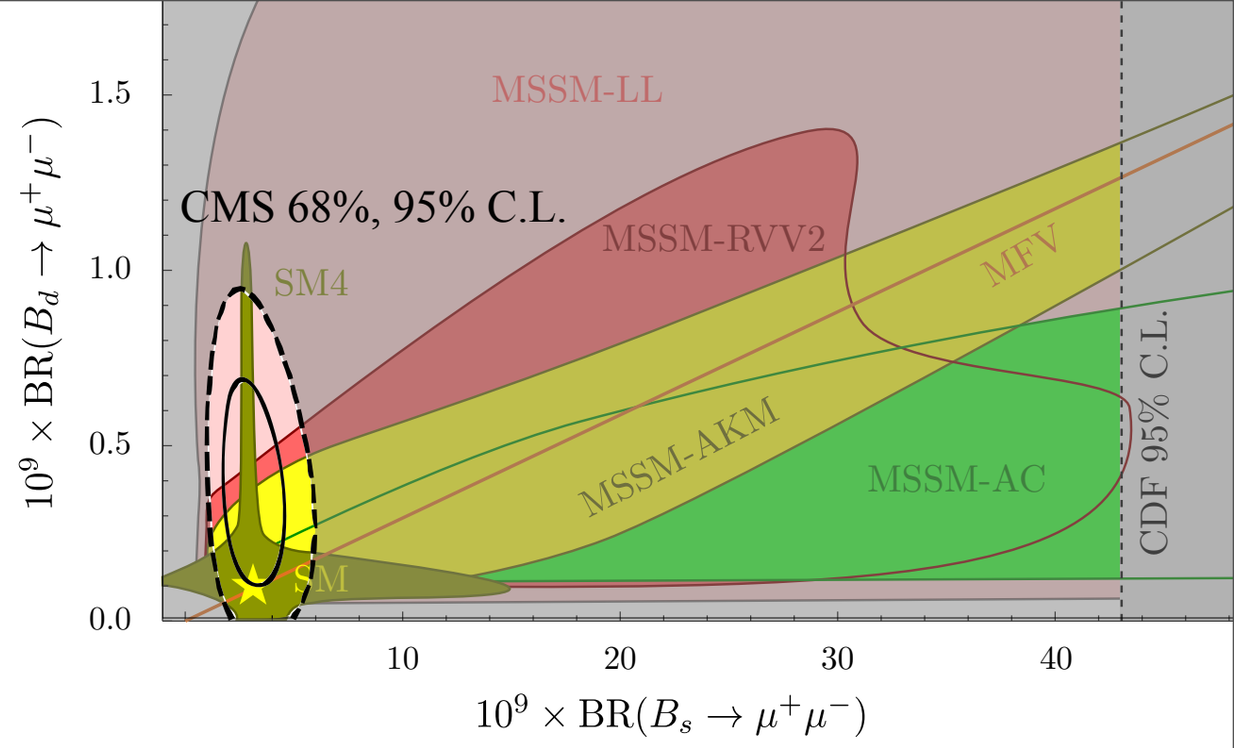


$$\mathcal{A}_{BSM} = \mathcal{A}_0 \left(\frac{C_{SM}}{m_W^2} + \frac{C_{NP}}{\lambda_{NP}^2} \right)$$

What is the scale of λ_{NP}? How much different are C_{NP} and C_{SM}?

- Investigation également possible pour les processus très rares faisant intervenir les quarks (en particulier quark b à LHCb)
- Donne des indications indirectes, complémentaires des recherches directes d'ATLAS ou CMS

- Méson Bs (b + anti-s) -> mu+ mu-
- Très supprimé dans le Modèle Standard, très sensible à certains types de nouvelle physique



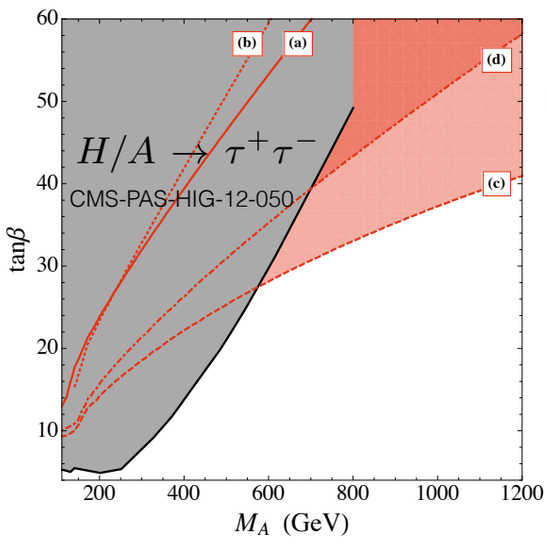
$B_{s,d} \to \mu^+\mu^-$

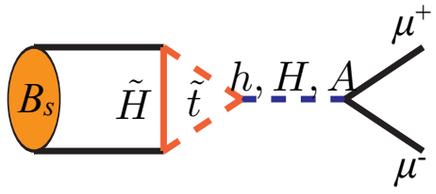
Particularly sensitive to FCNC scalar currents and FCNC Z penguins

Clean probe of the Yukawa interaction (⇒ Higgs sector) beyond tree level

Example: MFV MSSM with large $\tan\beta$

Altmannshofer et al., 1211.1976





$$\propto \frac{y_t^2}{16\pi^2}\frac{\mu A_t}{m_{\tilde{t}}^2}\frac{\tan\beta^3}{m_A^2}V_{tb}V_{ts}^*$$

Scenario	(a)	(b)	(c)	(d)	(e)
μ [TeV]	1	4	-1.5	1	-1.5
sign(A_t)	+	+	+	-	-

$m_{\tilde{q}} = 2\,\mathrm{TeV}$

$6M_1 = 3M_2 = M_3 = 1.5\ \mathrm{TeV}$

A_t fixed by m_h

- qui prédisent des correlations avec la désintégration Bd (b + anti d) -> mu+ mu-

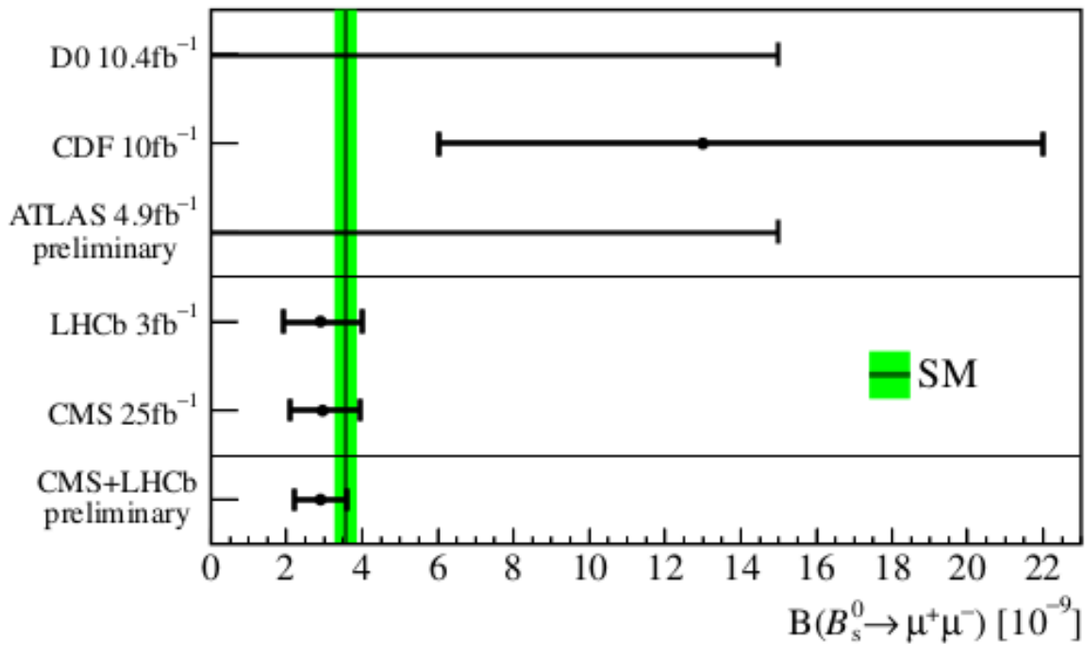
Combined LHCb + CMS Result

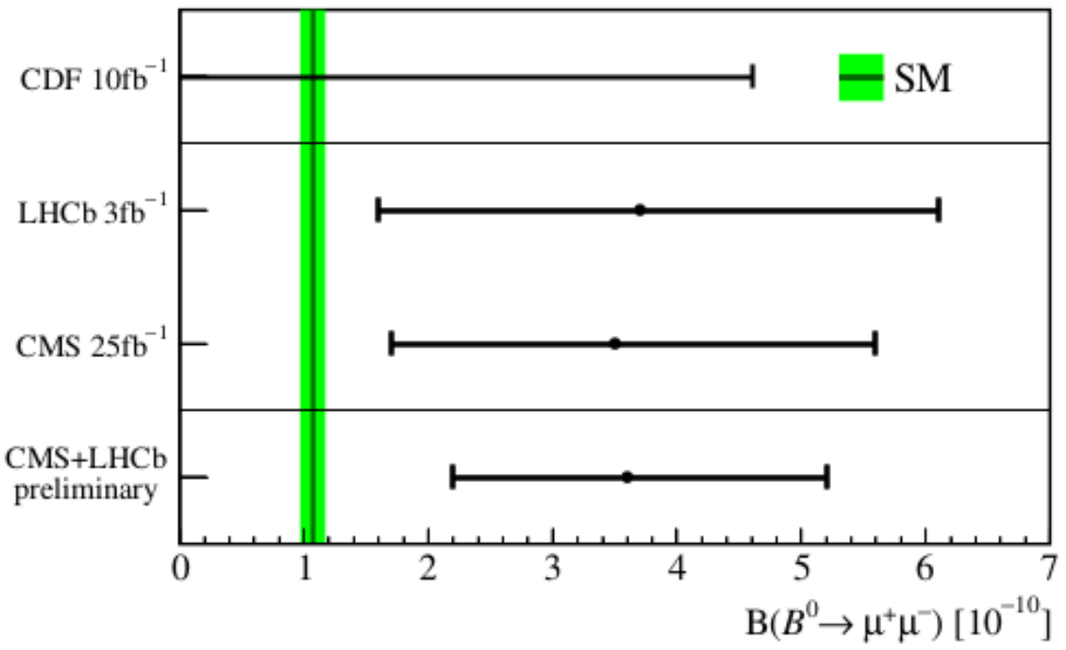
new @ EPS2013

Observation:

$\mathrm{BR}(B_s \to \mu^+\mu^-) = (2.9 \pm 0.7) \times 10^{-9}$

$\mathrm{BR}(B^0 \to \mu^+\mu^-) = 3.6^{+1.6}_{-1.4} \times 10^{-10}$





LHCb-CONF-2013-012, CMS-PAS-BPH-13-007

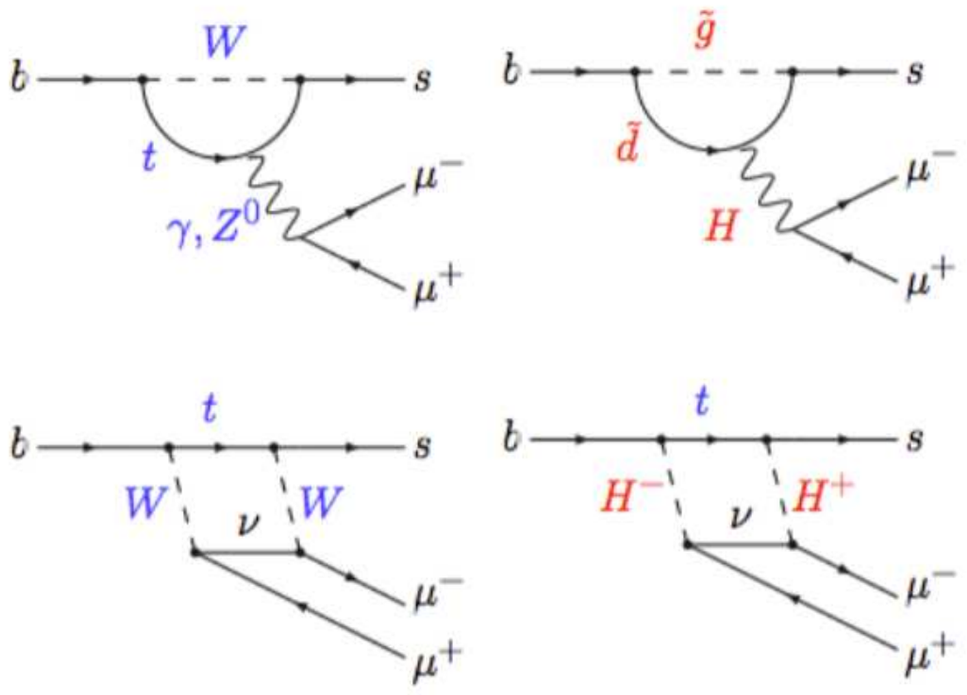
$b \to s$ Transitions

General description of Hamiltonian in operator product expansion:

$$H_{eff} = -\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \sum_i \Big[\underbrace{C_i(\mu) O_i(\mu)}_{\text{left-handed part}} + \underbrace{C_i'(\mu) O_i'(\mu)}_{\text{right-handed part suppressed in SM}} \Big]$$

i = 1,2	Tree
i = 3 – 6,8	Gluon penguin
i = 7	Photon penguin
i = 9,10	Electroweak penguin
i = S	Higgs (scalar) penguin
i = P	Pseudoscalar penguin

$b \to s$ transitions are sensitive to $O_7^{(\prime)}$, $O_9^{(\prime)}$, $O_{10}^{(\prime)}$



- D'autres transitions similaires au niveau des quarks, mais plus compliquées en termes de hadrons
- En particulier B -> K* mu+ mu-

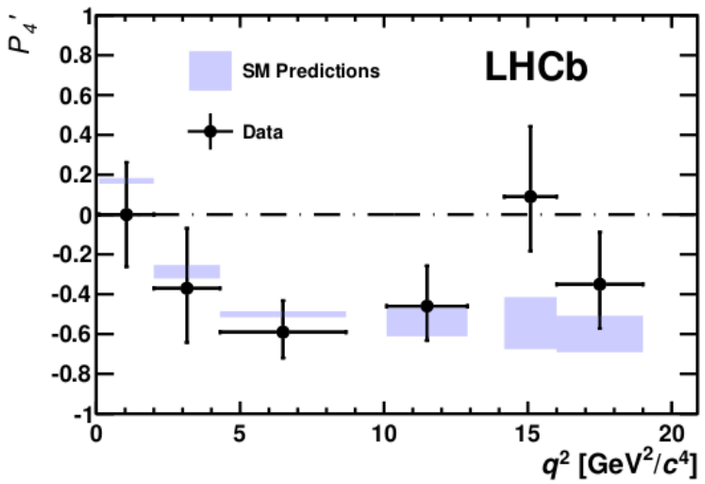
$B^0 \to K^* \ell^+ \ell^-$ is the most prominent (large statistic and flavour specific) candidate

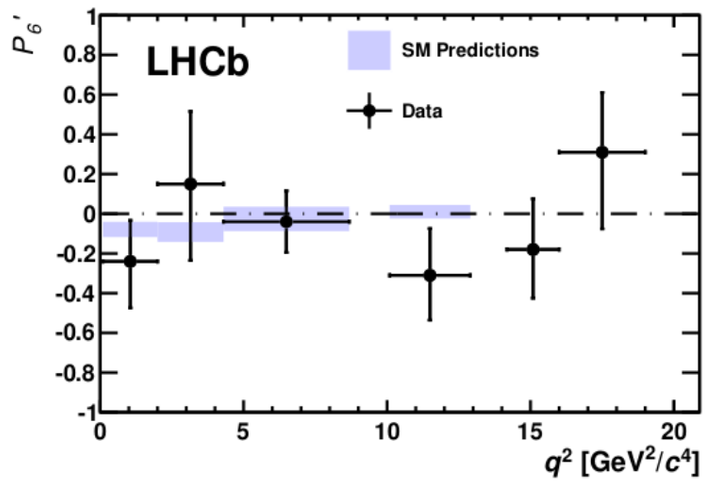
Studies in statistical limited $B_s \to \phi \mu^+ \mu^-$, $\Lambda_b \to \Lambda \mu^+ \mu^-$ started ...

New Observables in $B^0 \to K^* \mu^+ \mu^-$

LHCb-PAPER-2013-037

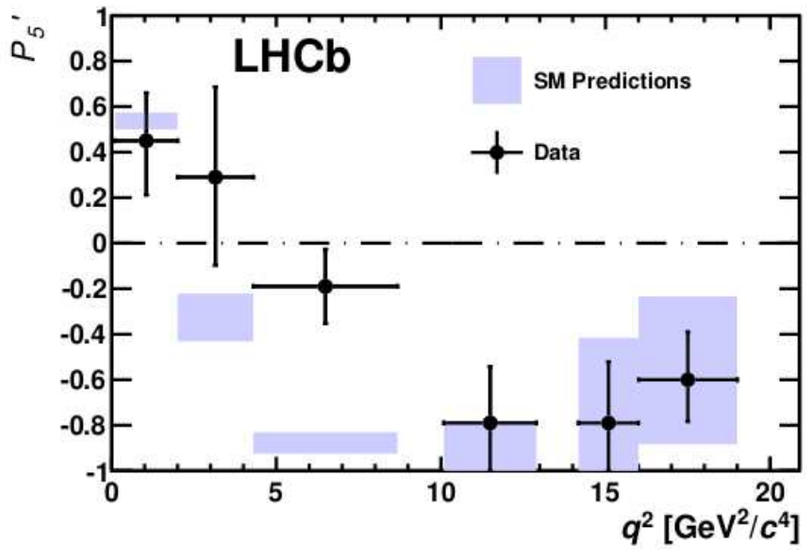
Very good agreement in P_4', P_6', P_8'

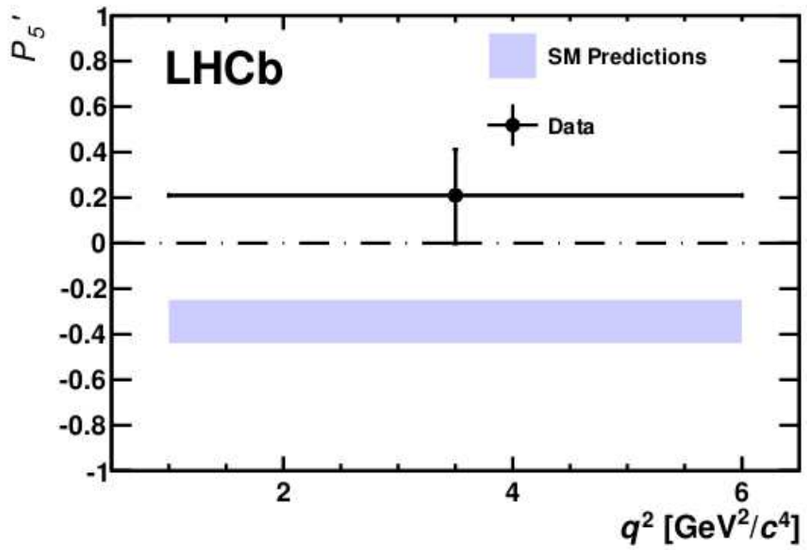




- Des écarts dans certaines observables décrivant la répartition angulaire des produits de désintégrations.
- De la NP ? Peut-être...

some tension in P_5' (3.7 σ):





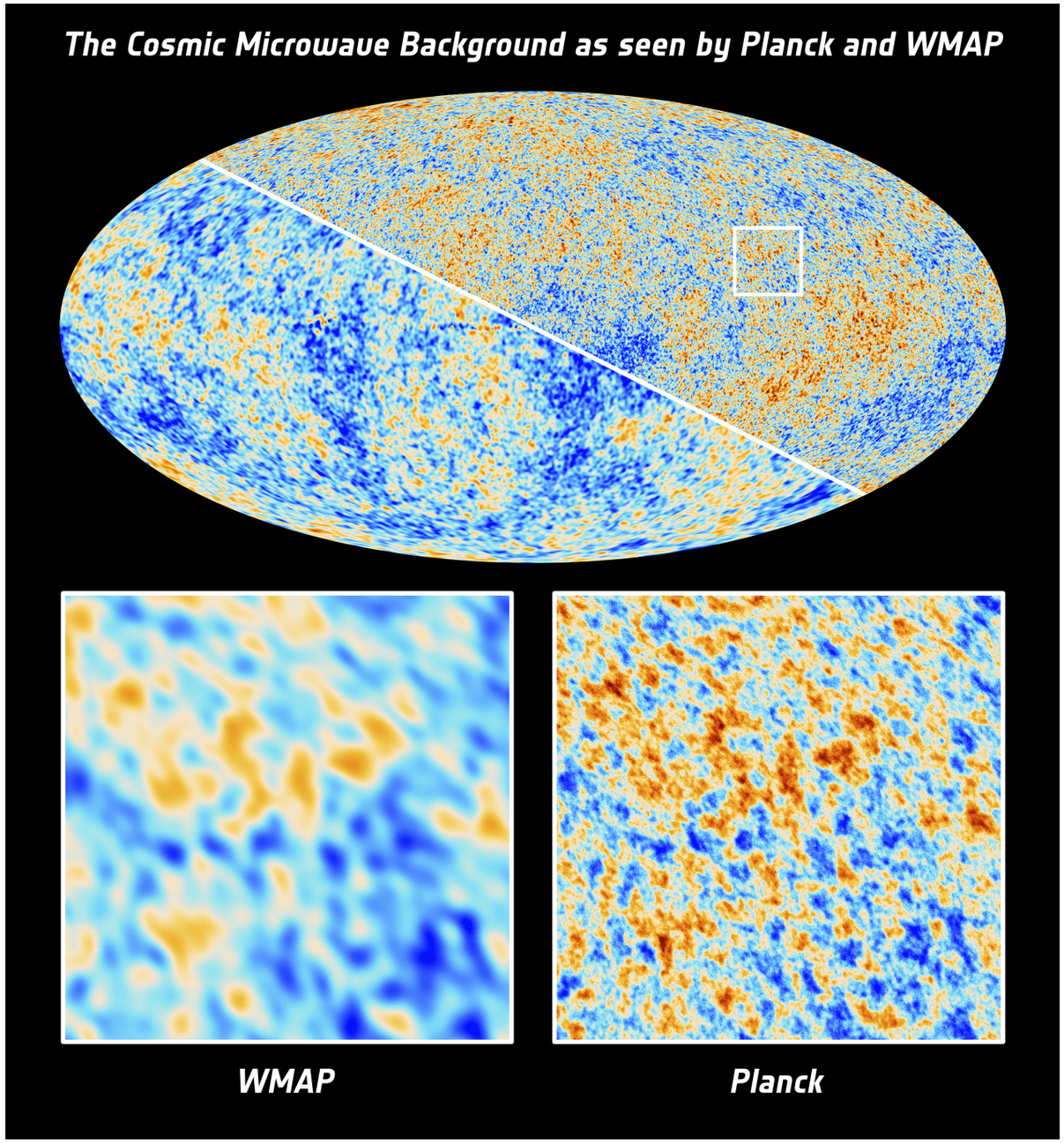
new @ EPS2013

Discussion at EPS resulted in an article:
Descotes, Matias, Virto
arXiv:1307.5683

0.5% probability to see such a deviation with 24 independent measurements.

Des nouvelles du ciel

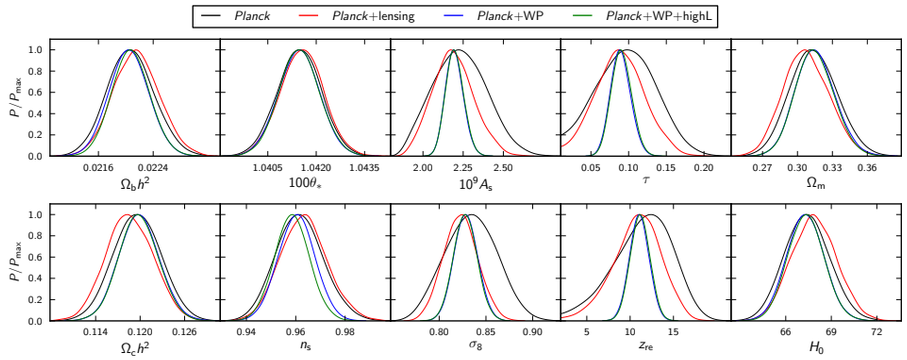
CMB maps : Planck vs WMAP

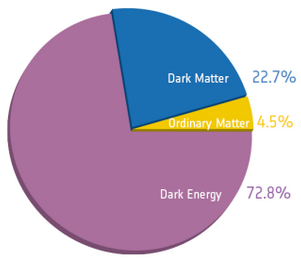


- Le satellite Planck a commencé à fournir des résultats sur le fonds diffus cosmologique...

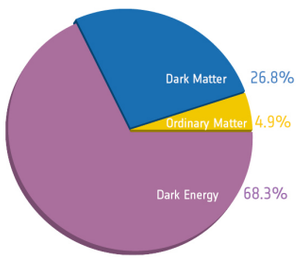
CMB only parameter fits

Planck 2013 results. XVI. Cosmological parameters

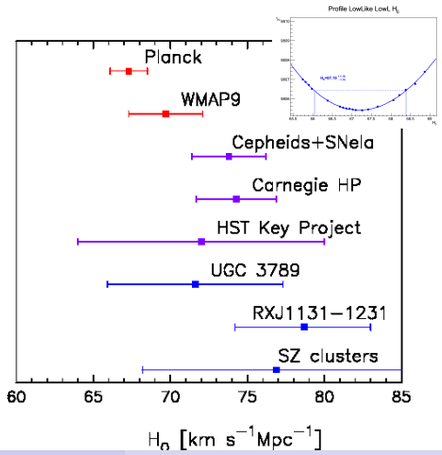




Before Planck



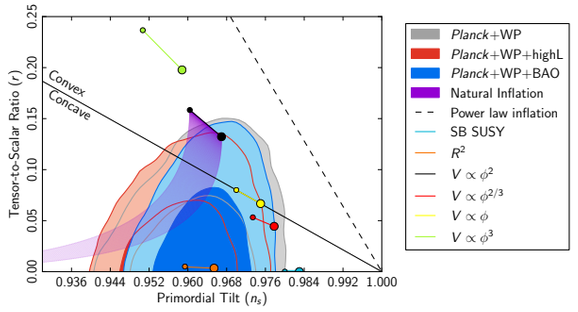
After Planck

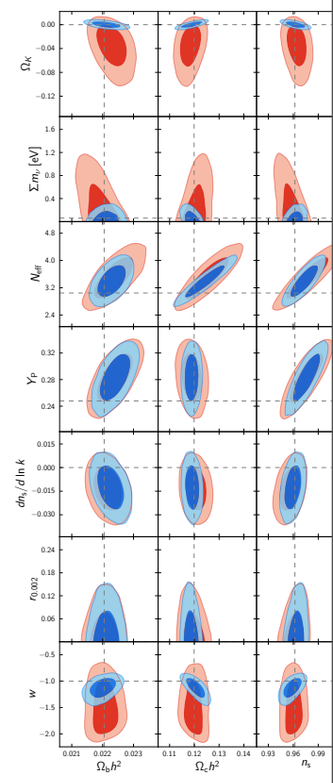


- En bon accord avec le scénario cosmologique standard (Lambda-CDM) et les autres observations (Supernovae Ia)
- Modèle d'inflation favorisé
- D'autres résultats attendus bien vite!

Summary of cosmology as measured usi + BAO

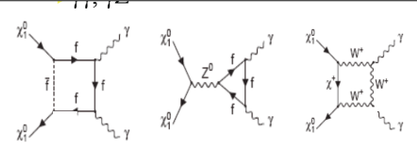
- The 6 parameter ΛCDM is a good fit !
- lower H_0 , larger Ω_m
- Flat universe : $100\Omega_K = -0.1 \pm 0.6$ (95% c.l.)
- $N_{eff} = 3.36 \pm 0.34$; $\Sigma m_\nu < 0.66$ (95
- dark energy : $w = -1.13 \pm 0.24$ (95% c.l.), compatible with Λ
- good agreement with BBN
- large angular scale $\sim 2\sigma$ "anomaly"
- $n_s = 0.96$ at more than 5σ, no evidence for running, limit on tensor modes





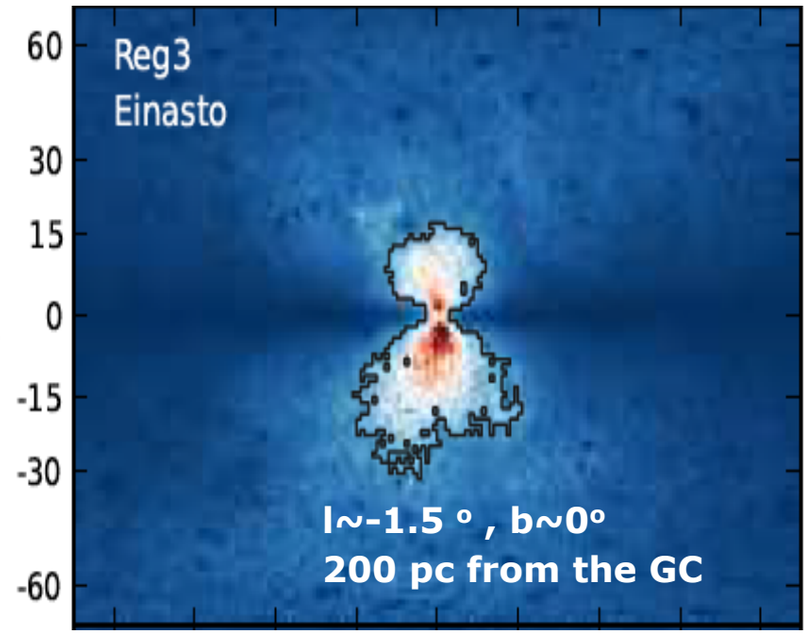
Planck 2013 results. XVI. (parameters) & XXII. (inflation constraints) - and others !

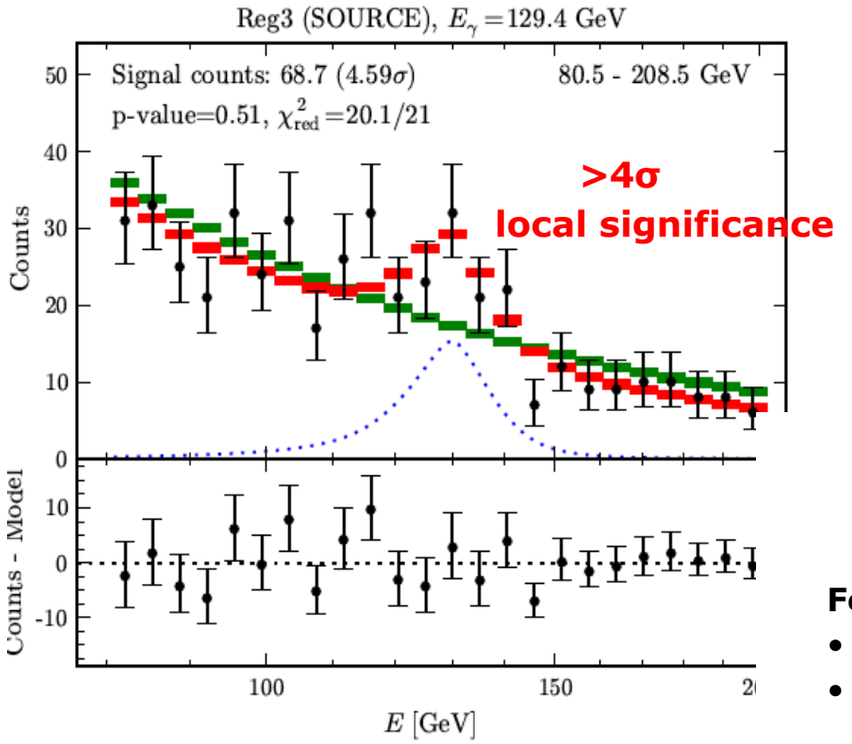
γ-ray lines Fermi LAT data



43 Months of Fermi public data

T.Bringmann et al [arXiv:1203.1312] C. Weniger arXiv:1204.2797v2





Target region : reg3 surrounding the Galactic center

Optimizing s/b in the energy 1-20 GeV , for variety DM profiles

If Dark Matter=> Br(γγ)≈3-4%

$$\chi\chi \to \gamma\gamma(\gamma Z) : M_\chi = 130(144)\ GeV$$

$$< \sigma v >= 1.3(3.1)\ 10^{-27} cm^3 s^{-1}$$

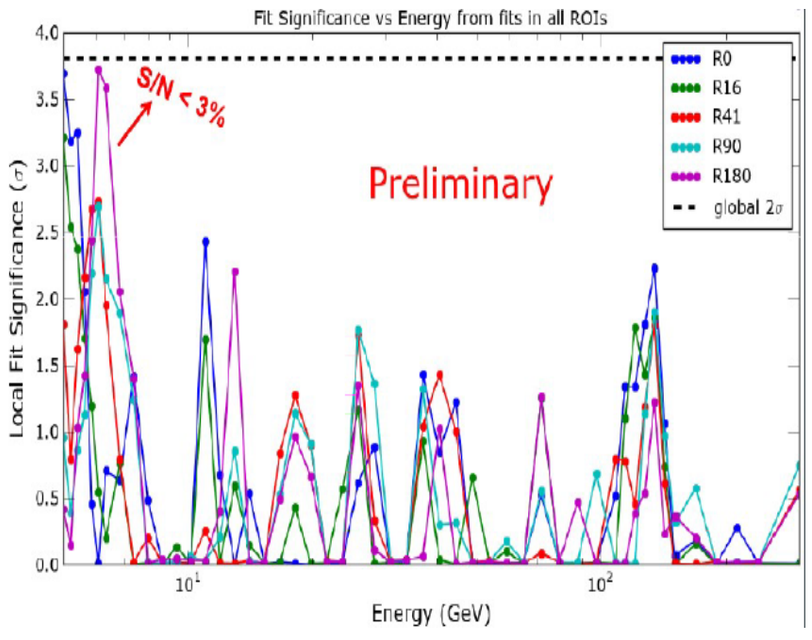
- Le satellite FERMI voyait une "raie" de gamma très énergétiques, la trace d'une annihilation de matière noire ?
- Plus de données, meilleure analyse... l'effet semble disparaître !

γ-ray lines - Fermi LAT ou

Fermi LAT, 4 years

- **new processing,**
- **new Regions of Interests (including Galactic Plane)**

No significant line structure found



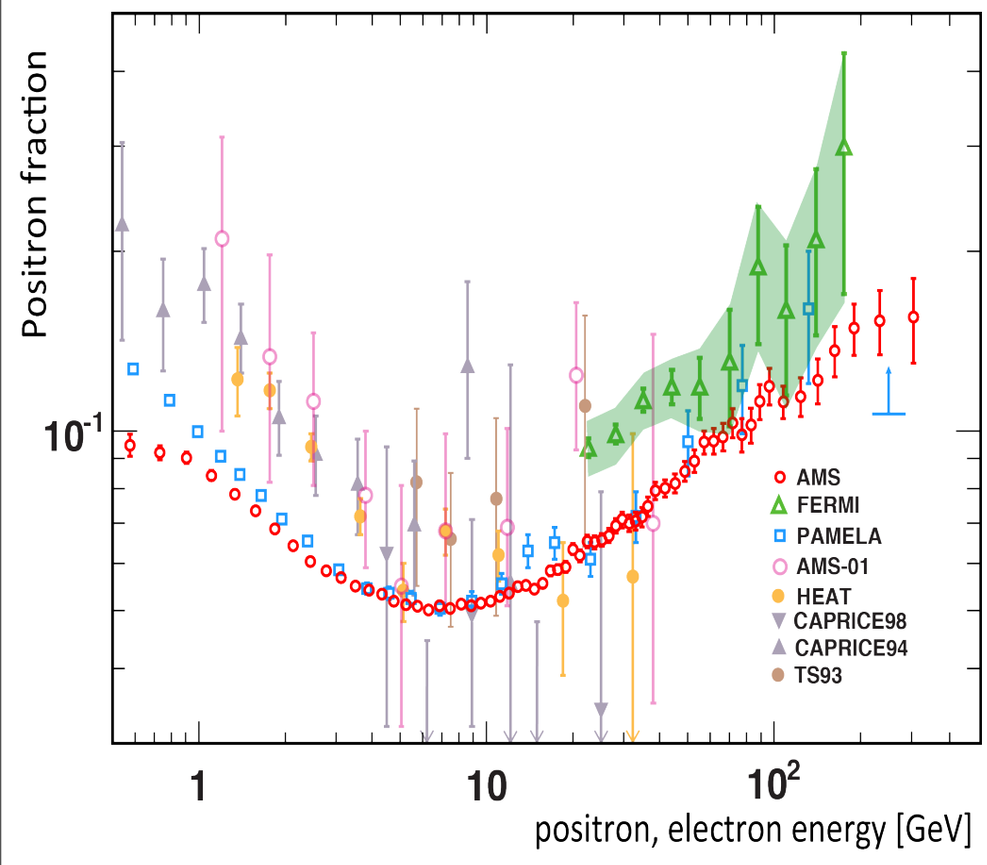
=> systematics studies on going (limb earth co

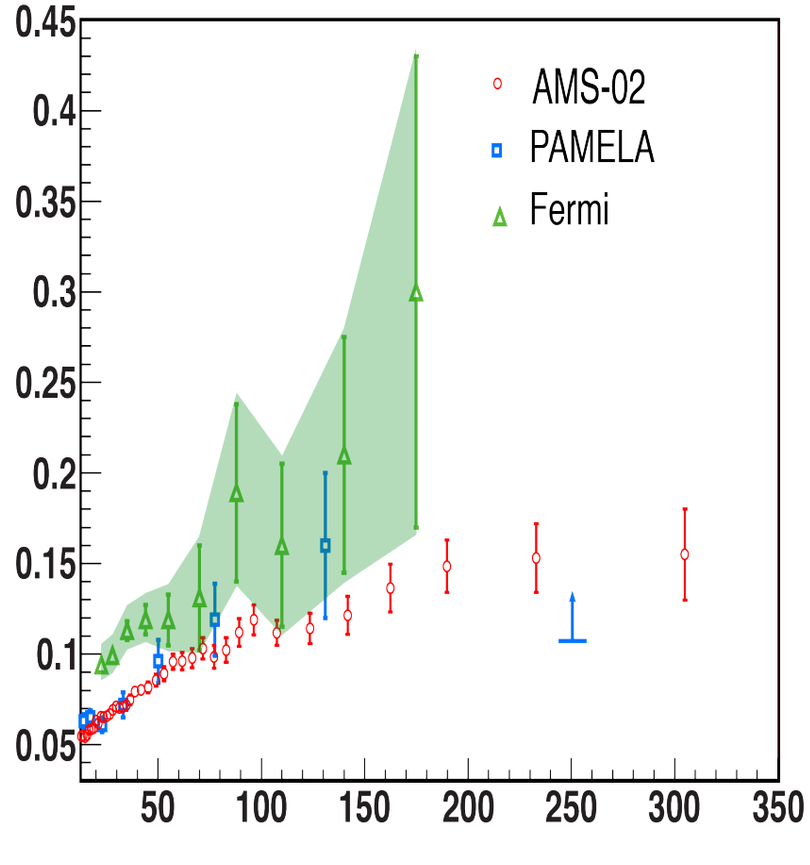
A publication expected in one year

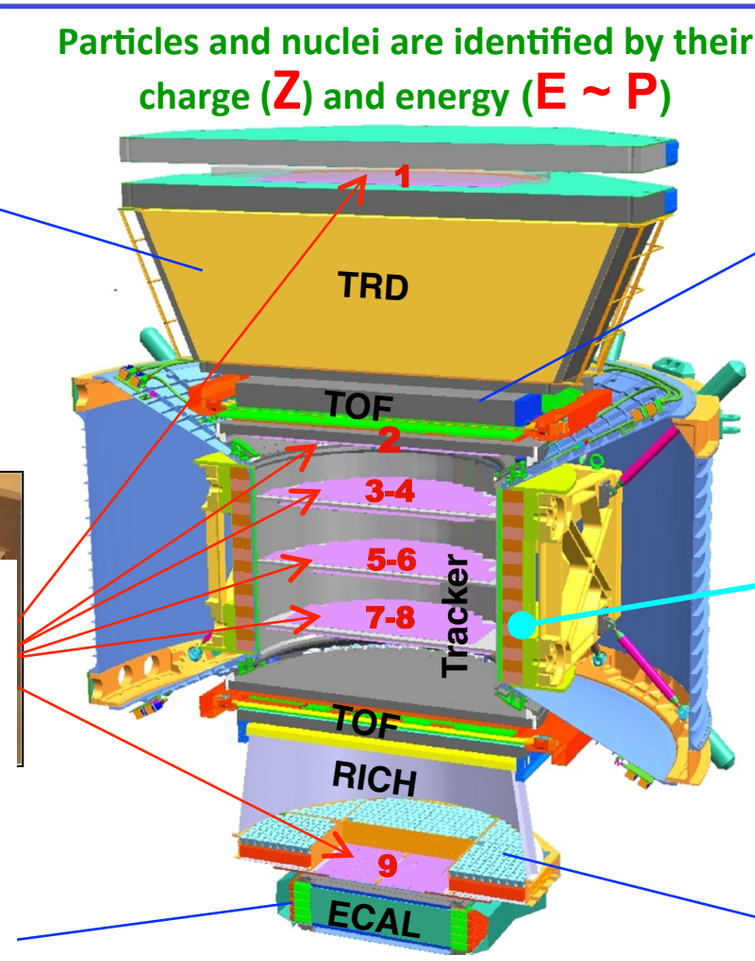
- De son côté, le satellite AMS confirme l'excès de positrons dans les rayons cosmiques de haute énergie

- Effet astrophysique ? Ou nouvelle physique ???

Positron fraction : measurement comparison





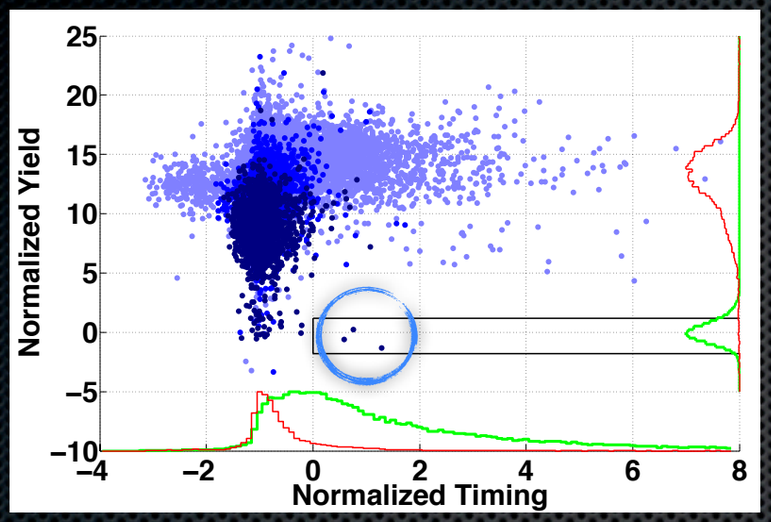


5m x 4m x 3m **7.5 tons**

Z, P are measured independently from Tracker, RICH, TOF and ECAL

New results from CDMS-Si

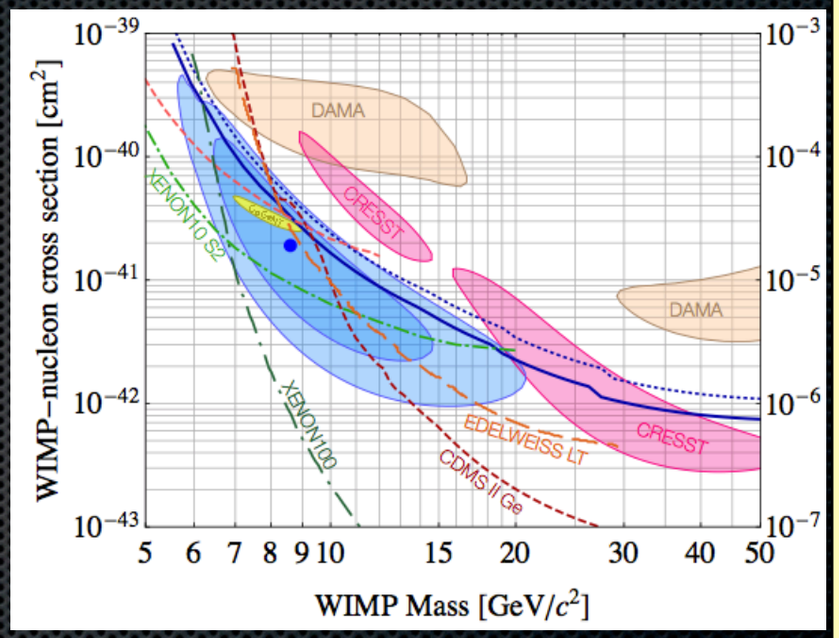
arXiv:1304.4279v2 [hep-ex] 4 May 2013



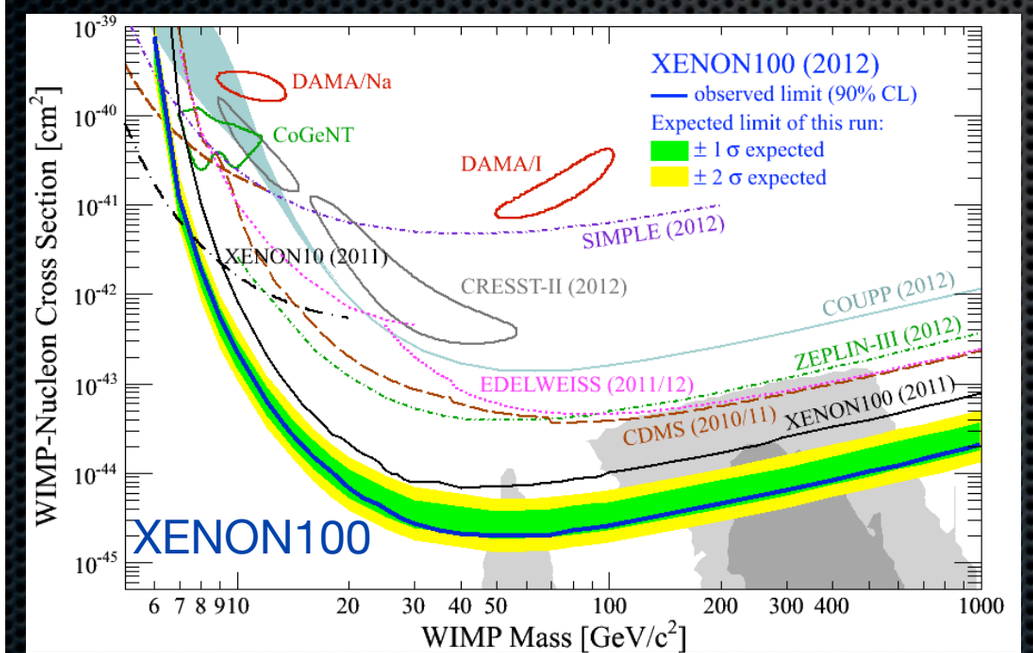
140 kg d exposure

3 events detected, 0.7 expected
likelihood analysis: 0.19% probability for known background-only hypothesis
best fit: 8.6 GeV, 1.9 x 10^{-42} cm2

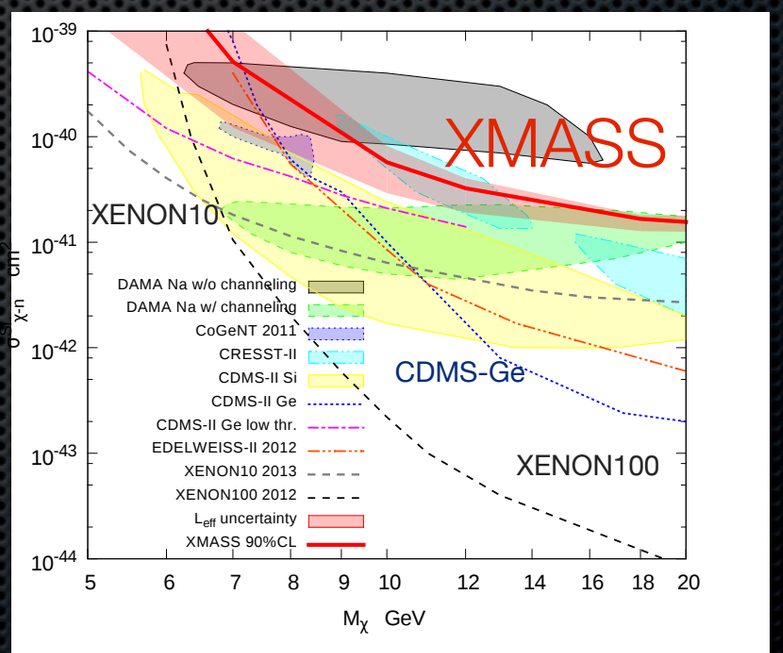
Analysis ongoing of low-threshold run (CDMS-lite) at Soudan with one Ge detector



- De nouveaux résultats pour la recherche de matière noire sur Terre en détectant son interaction avec de la matière ordinaire...
- Mais toujours de la confusion entre les expériences !



XMASS: Phys. Lett. B 719 (2013)



A l'année prochaine,
pour ICHEP 2014,
à Valence (Espagne)

ou dans deux ans,
pour Lepton-Photon 2015 à Ljubljana (Slovénie)
ou EPS-HEP 2015 à Vienne (Autriche) !