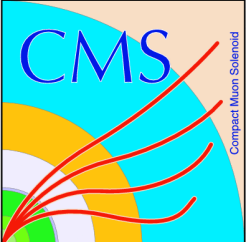




Danila TlISOV on behalf of CMS collaboration

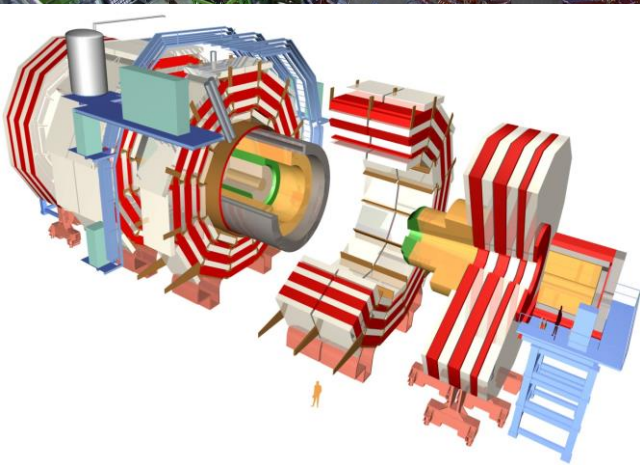
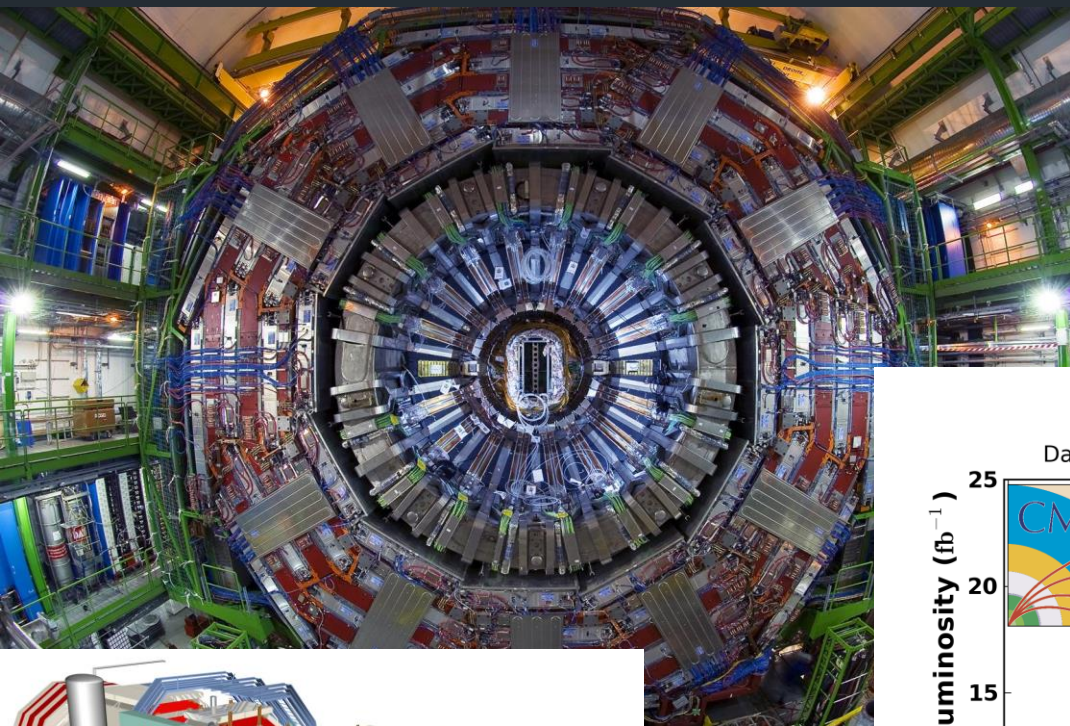
Exotica searches in pp collisions at 8 TeV in the CMS detector at the LHC

Introduction



Introduction

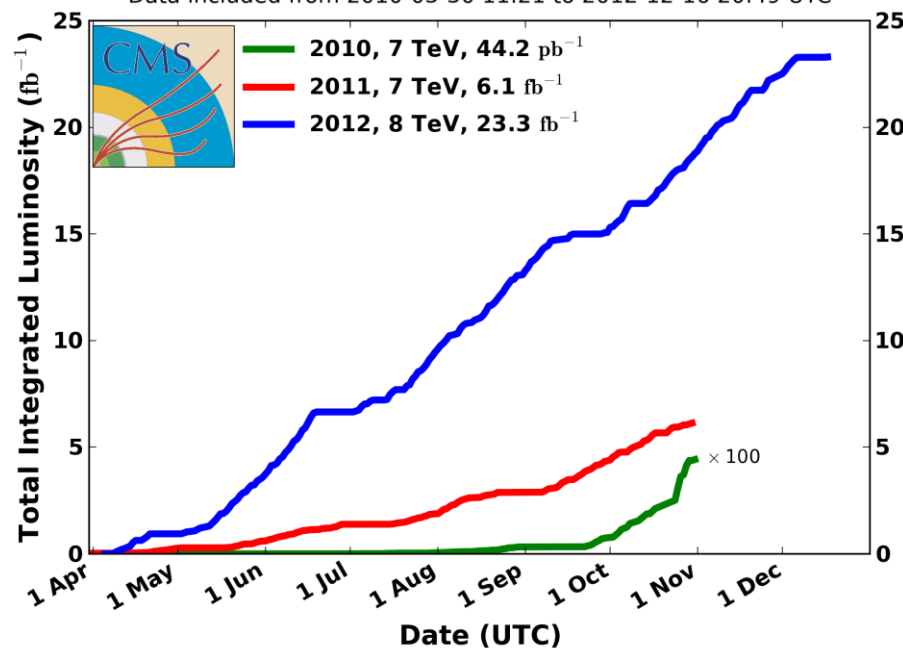
3



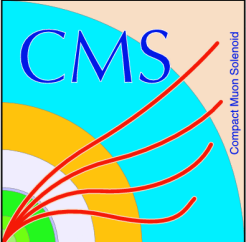
*Compact
Muon
Solenoid*

CMS Integrated Luminosity, pp

Data included from 2010-03-30 11:21 to 2012-12-16 20:49 UTC



1. Leptoquarks

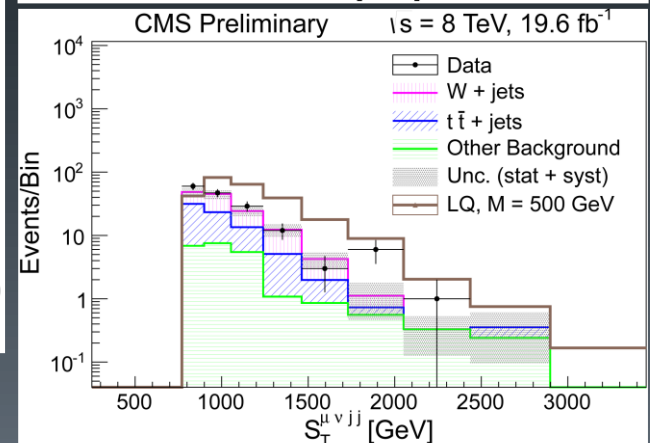
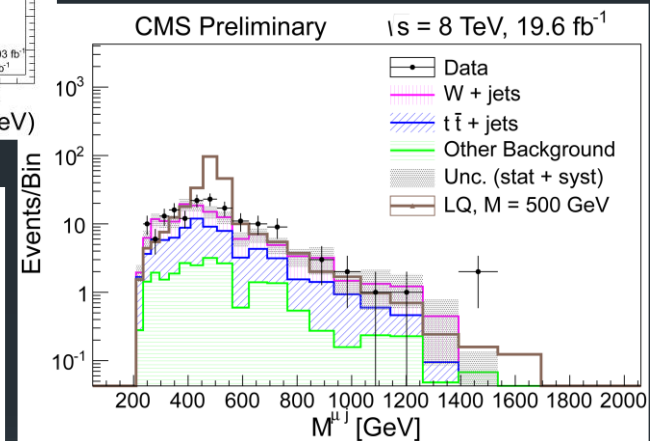
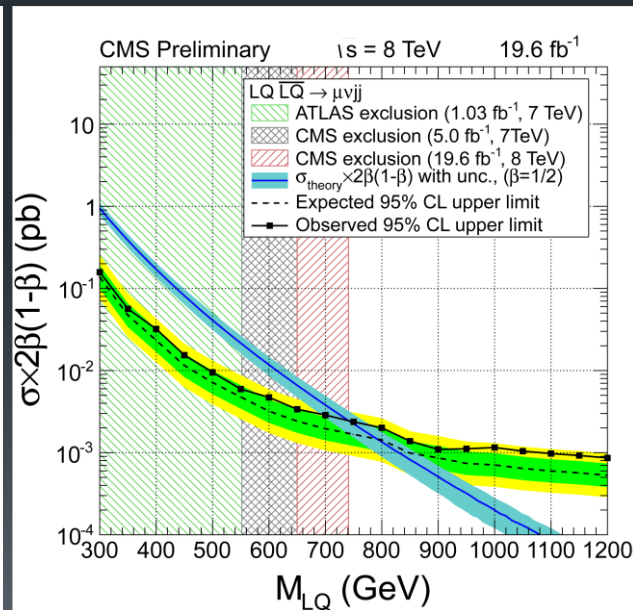
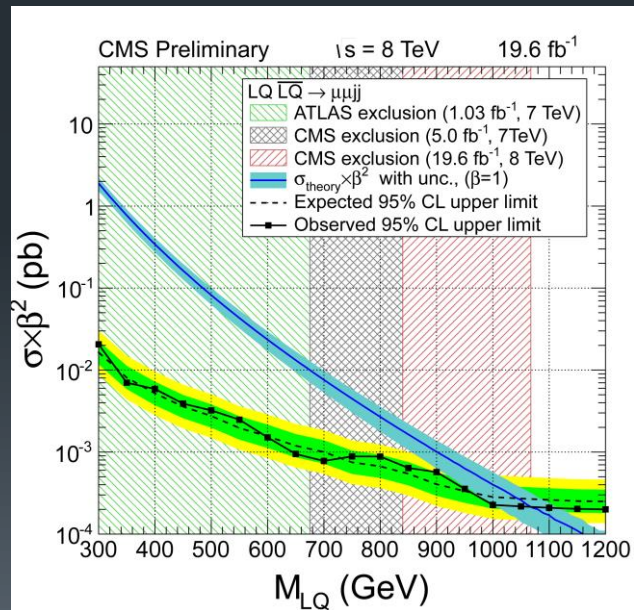
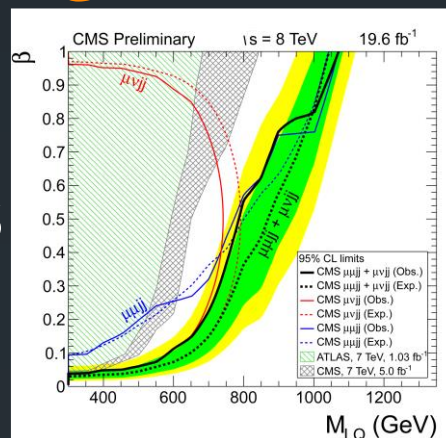


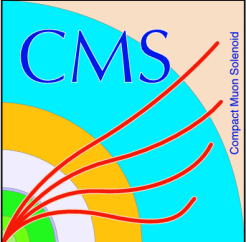
2-st gen. LQs searches

5

EXO-12-042

- $LQ \rightarrow l\nu, ll$
- Unification Theories
- Technicolor
- Composite Models





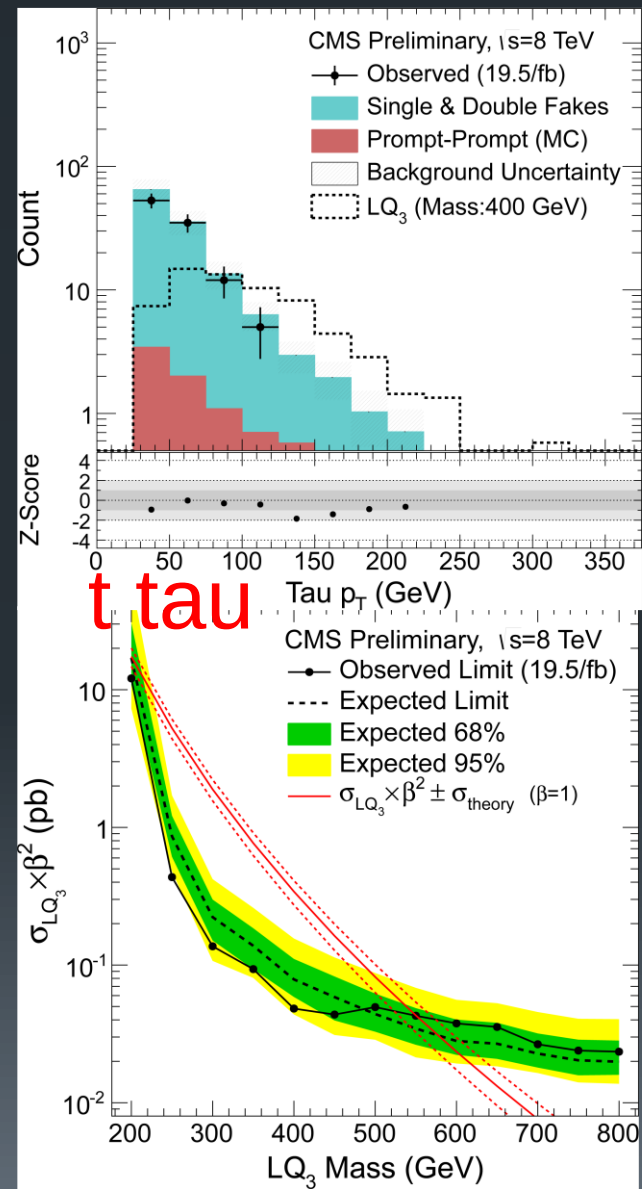
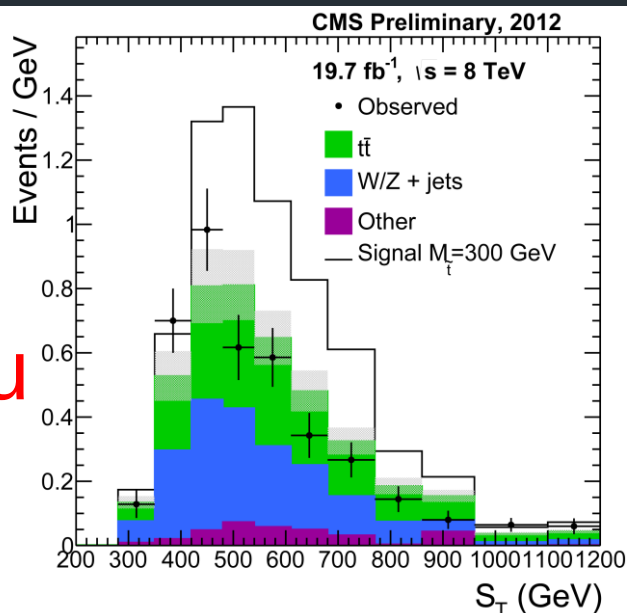
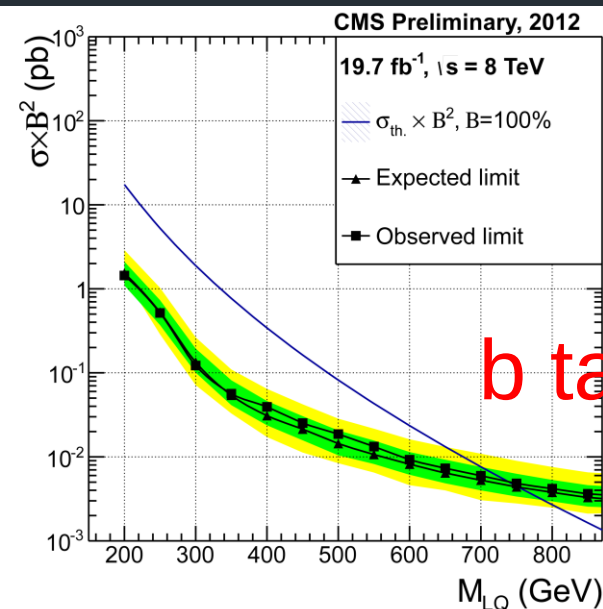
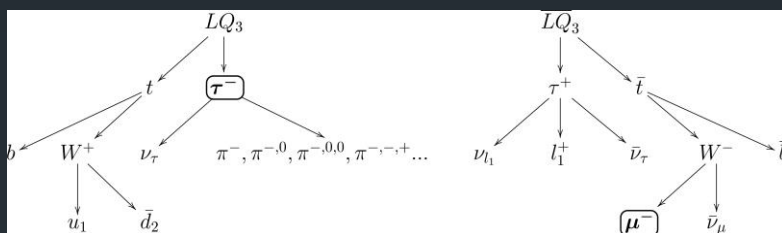
3-st gen. LQs searches

6

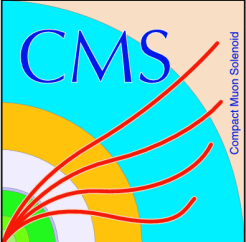
■ $LQ \rightarrow b\tau, t\tau$

EXO-12-030

EXO-12-032



2. Randall-Sundrum graviton



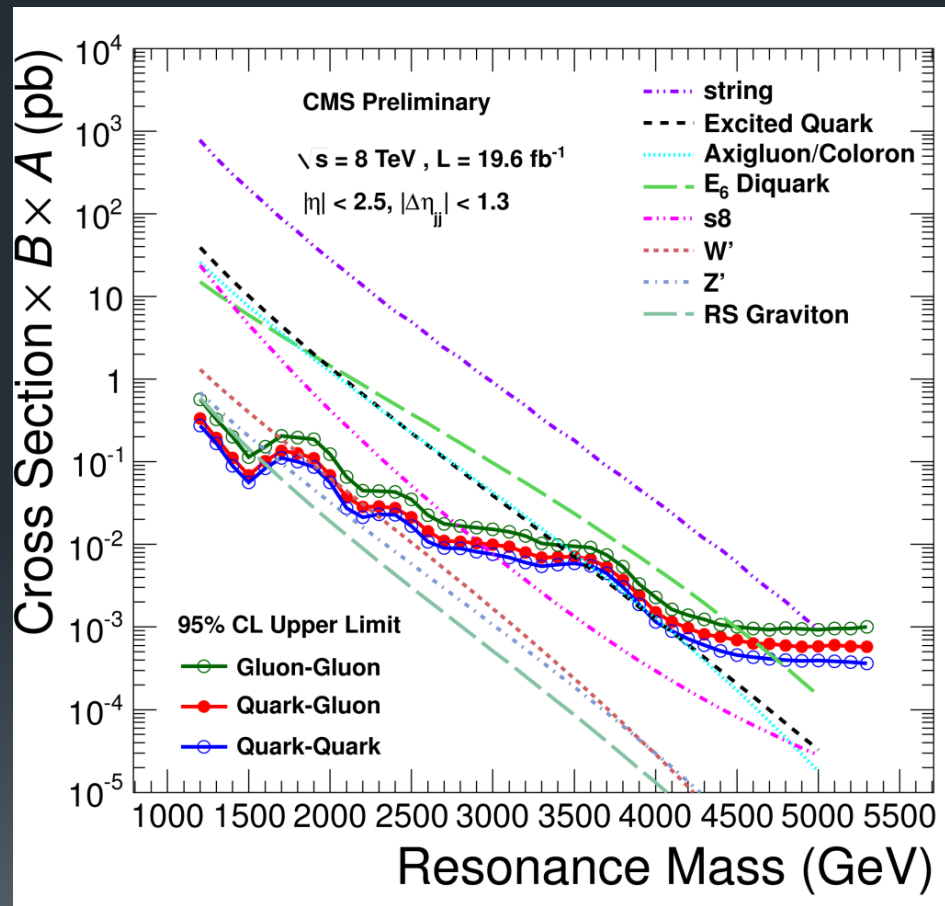
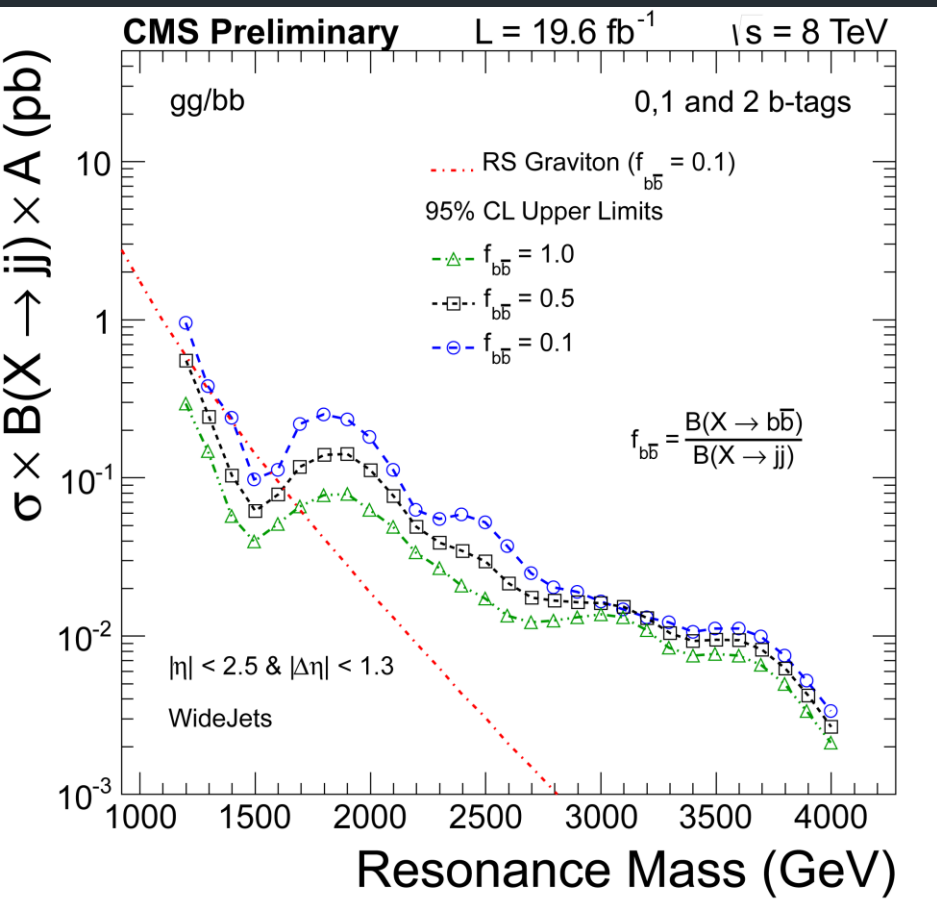
RS graviton searches

8

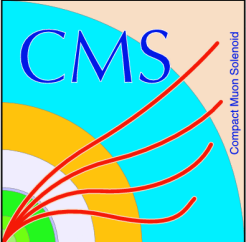


■ $G \rightarrow gg, bb, \text{jet jet}$

EXO-12-023, EXO-12-059



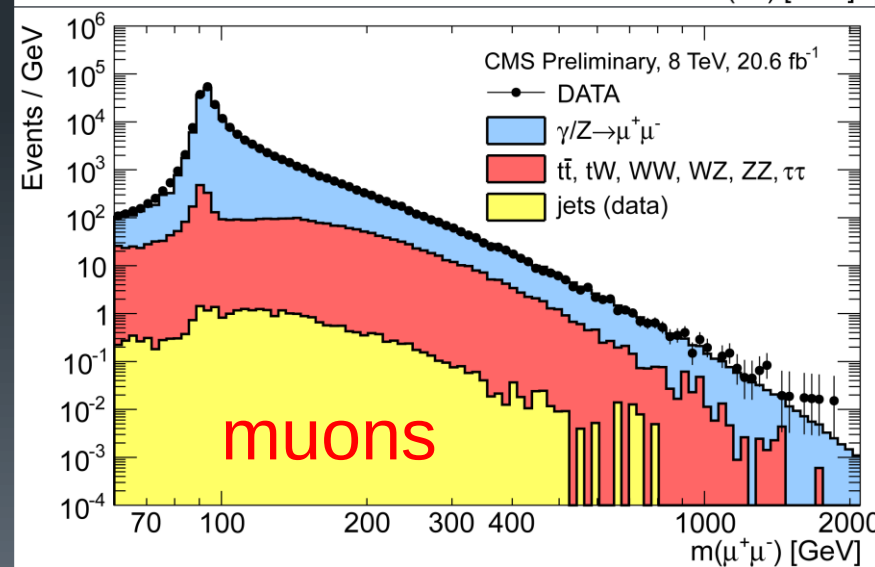
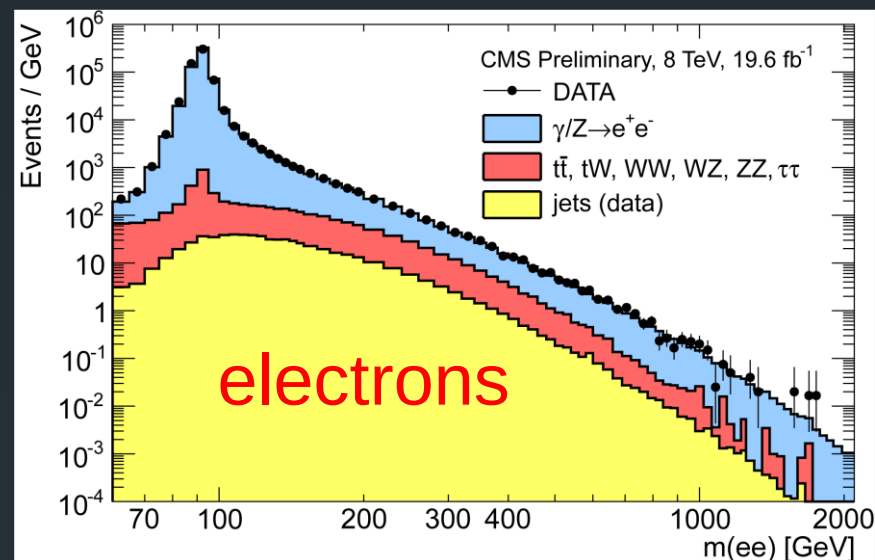
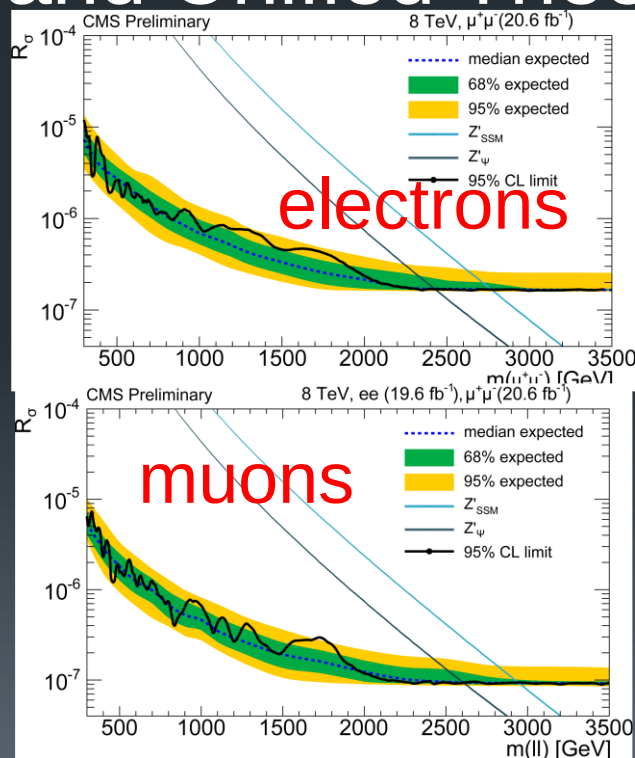
3. Heavy Gauge Bosons

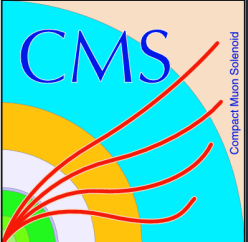


Z' searches

10

- $Z' \rightarrow \ell\ell$ EXO-12-061
- Sequential SM
- Grand Unified Theories

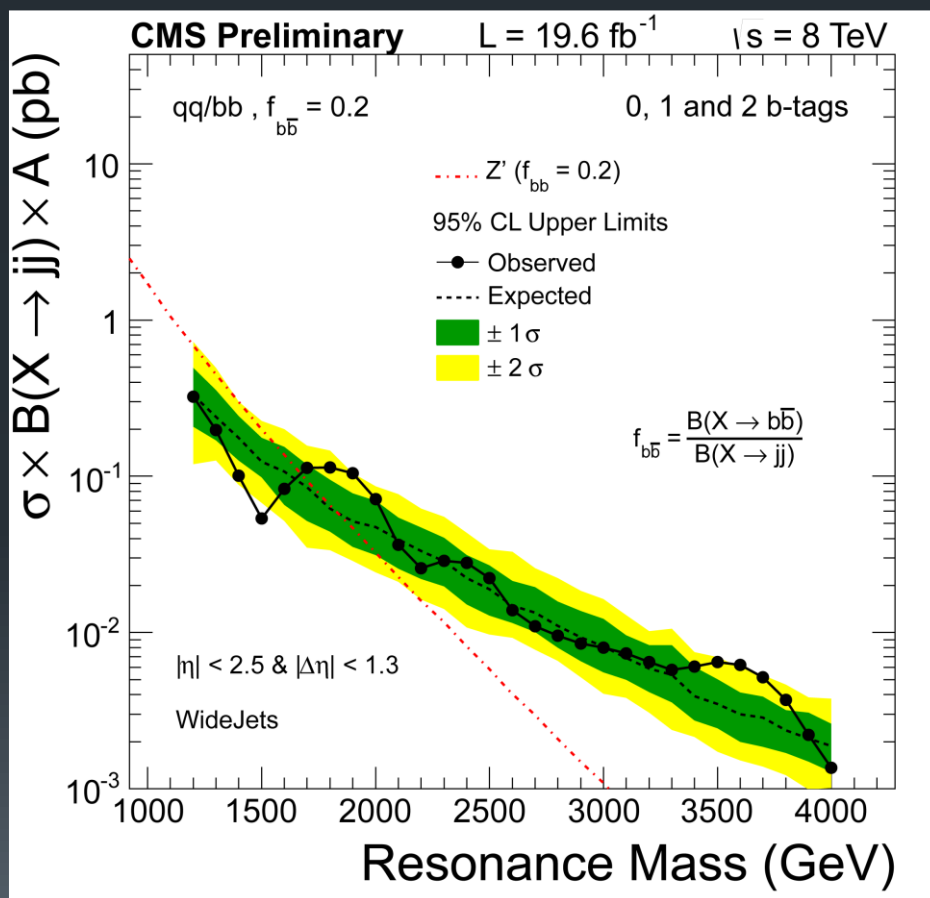
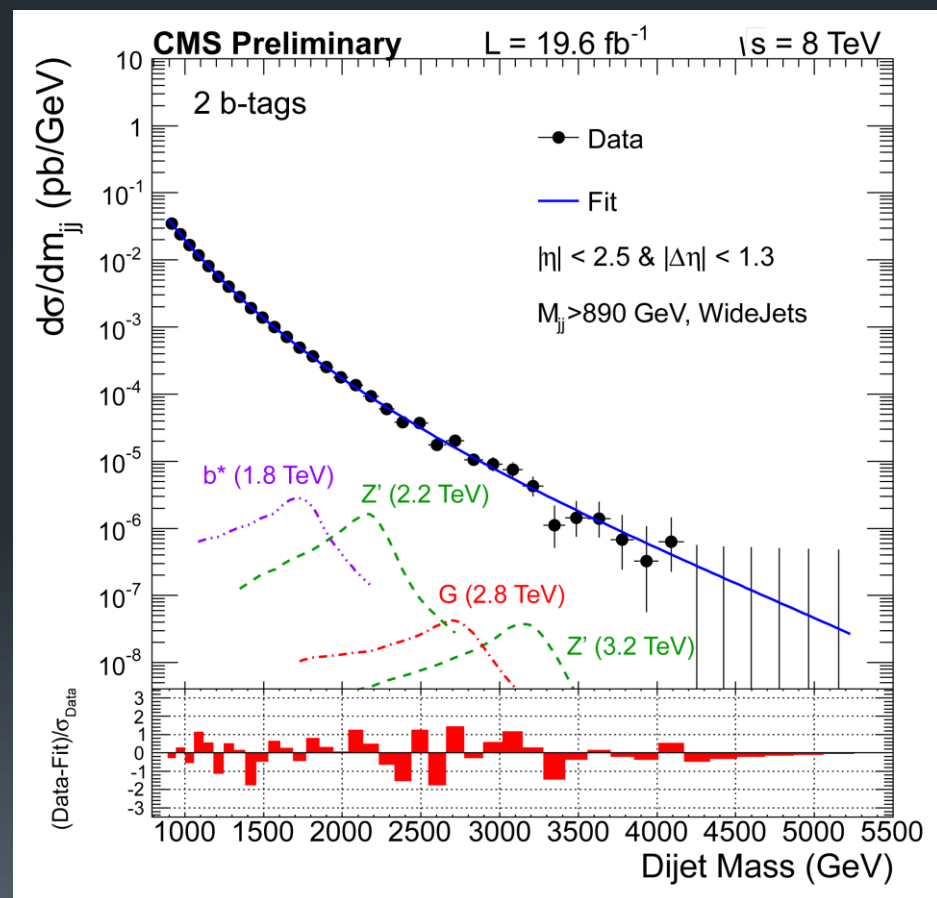


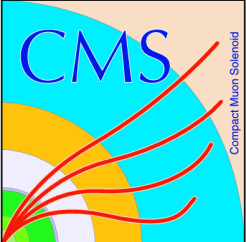


Z' searches

11

■ $Z' \rightarrow bb, bg$ EXO-12-023

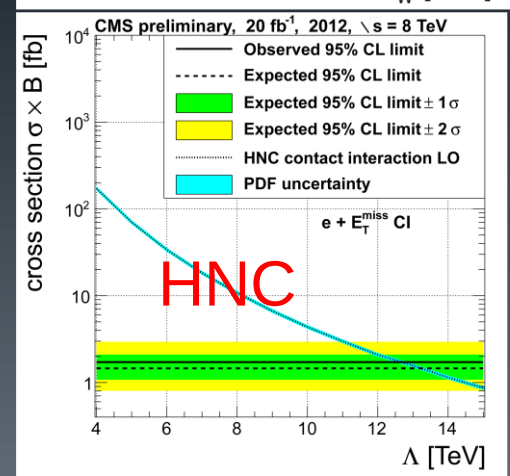
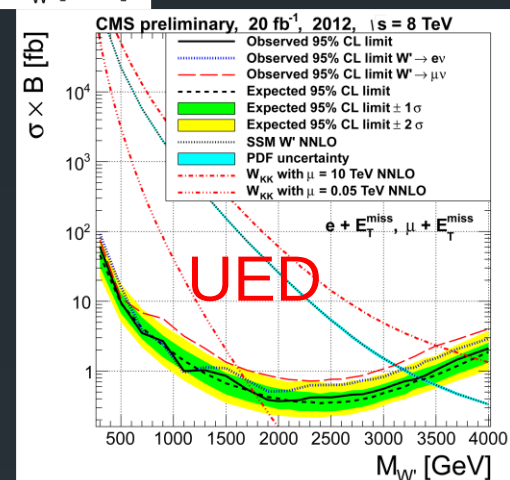
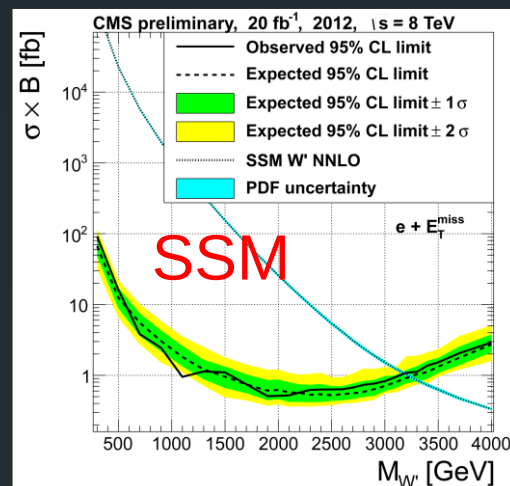
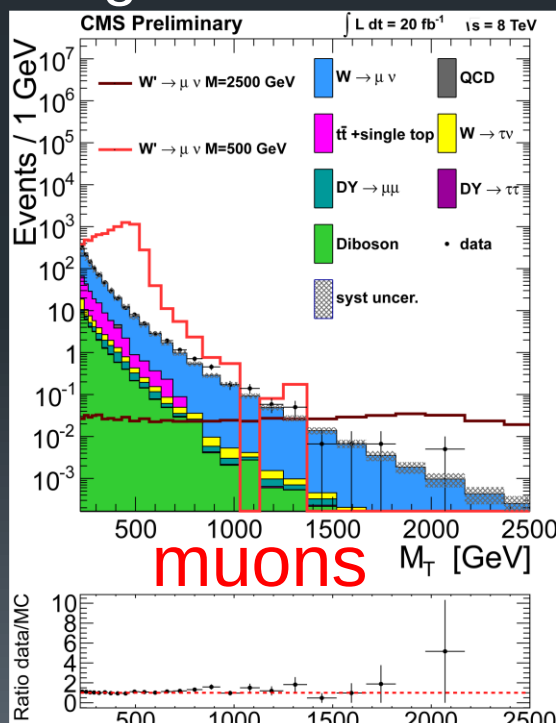
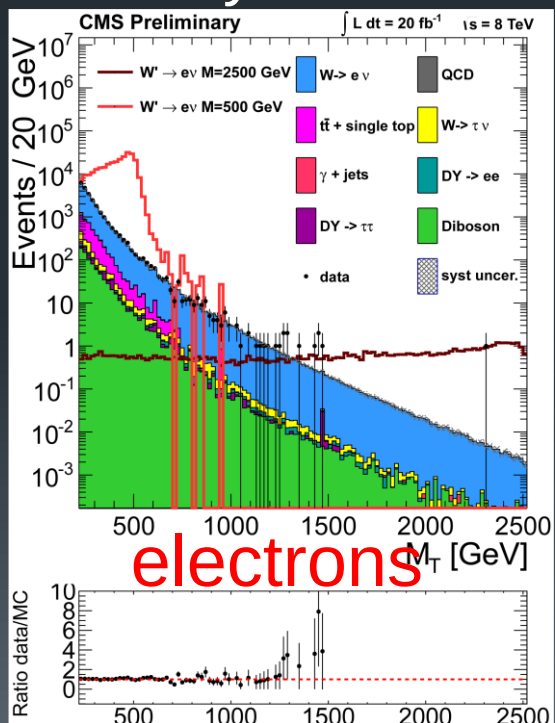


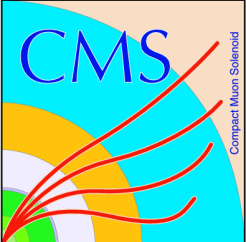


W' searches

12

- $W' \rightarrow \nu$
- Sequential SM
- Universal Extra Dimensions
- Helicity-Non-Conserving Model



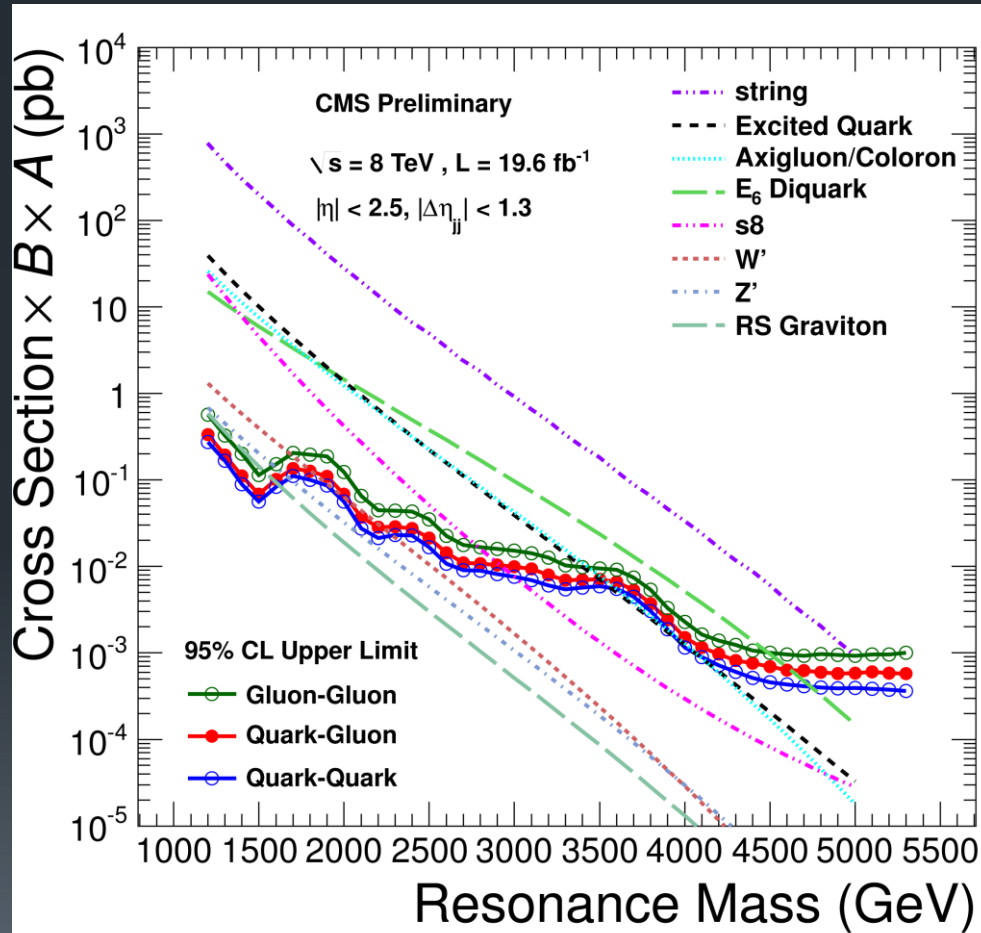
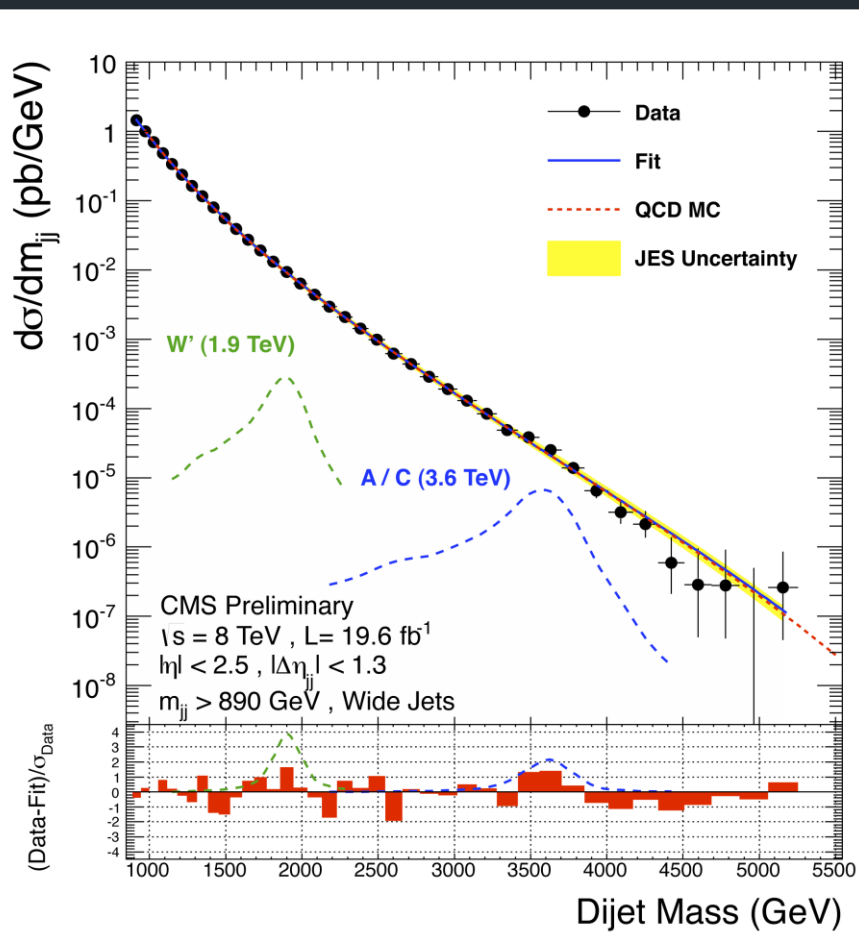


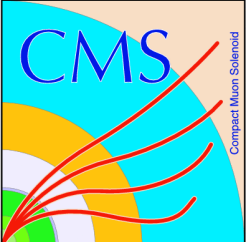
W' searches

13

■ $W' \rightarrow \text{jet jet}$

EXO-12-059



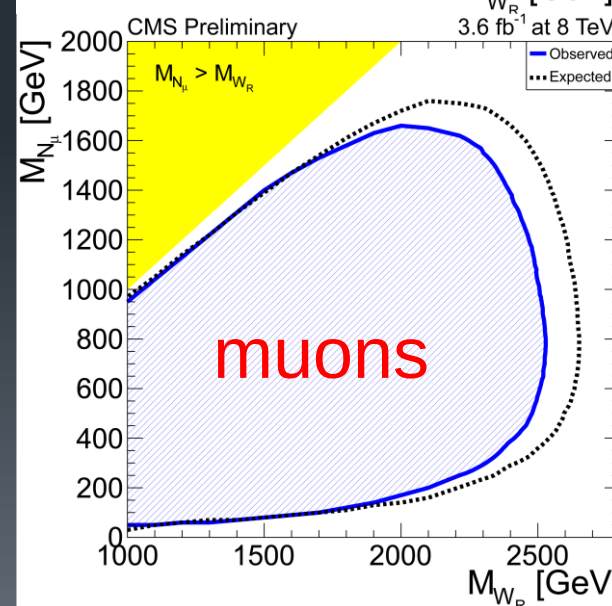
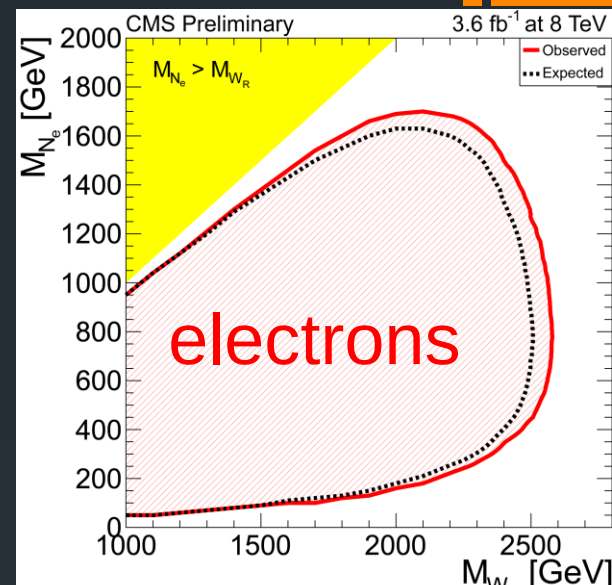
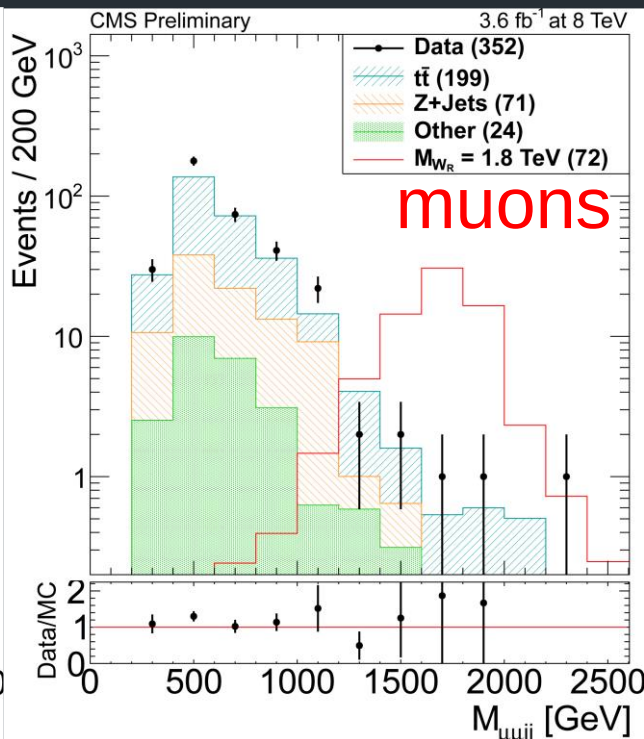
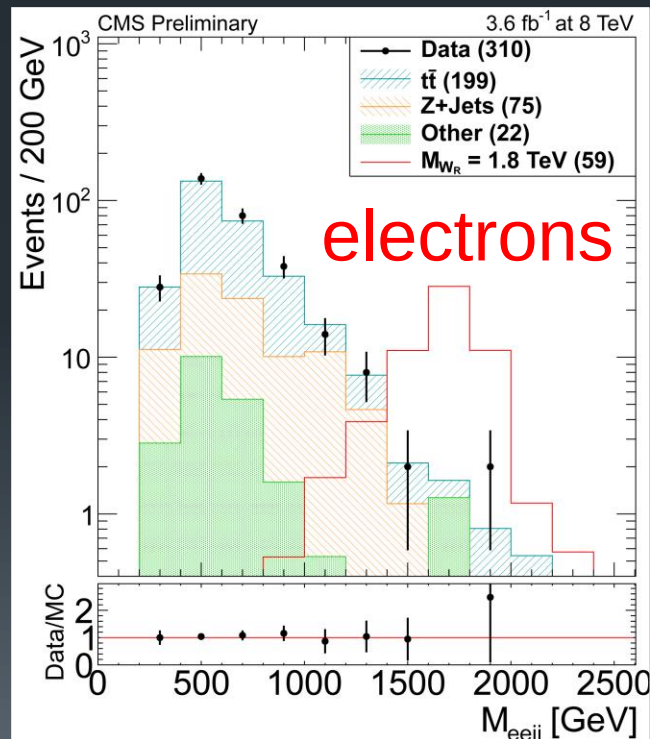


W_R and N_R searches

14

- $W_R \rightarrow lljj$
- LRS

EXO-12-017

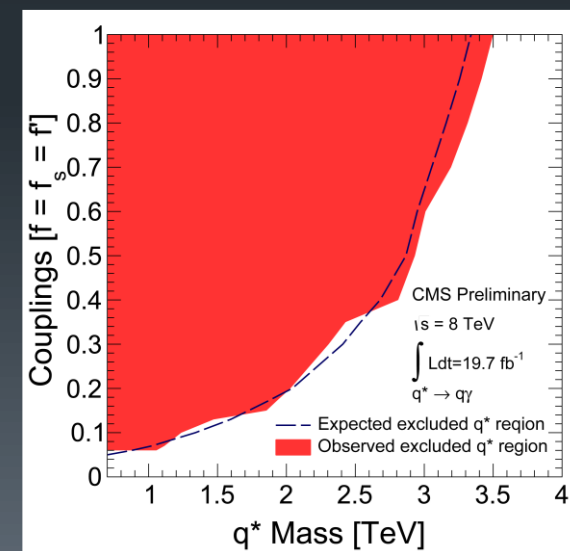
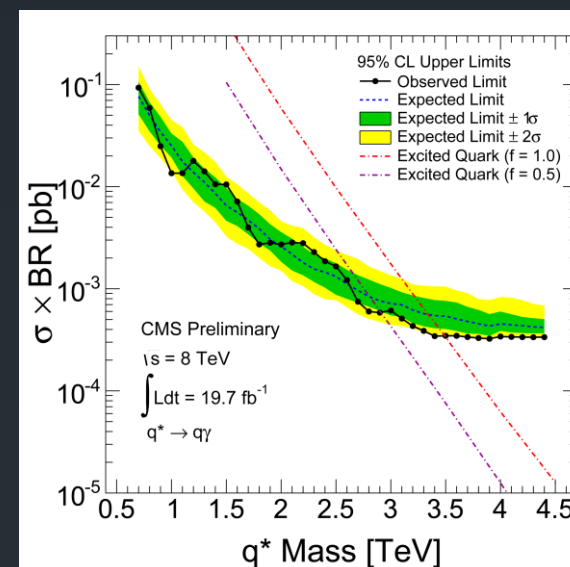
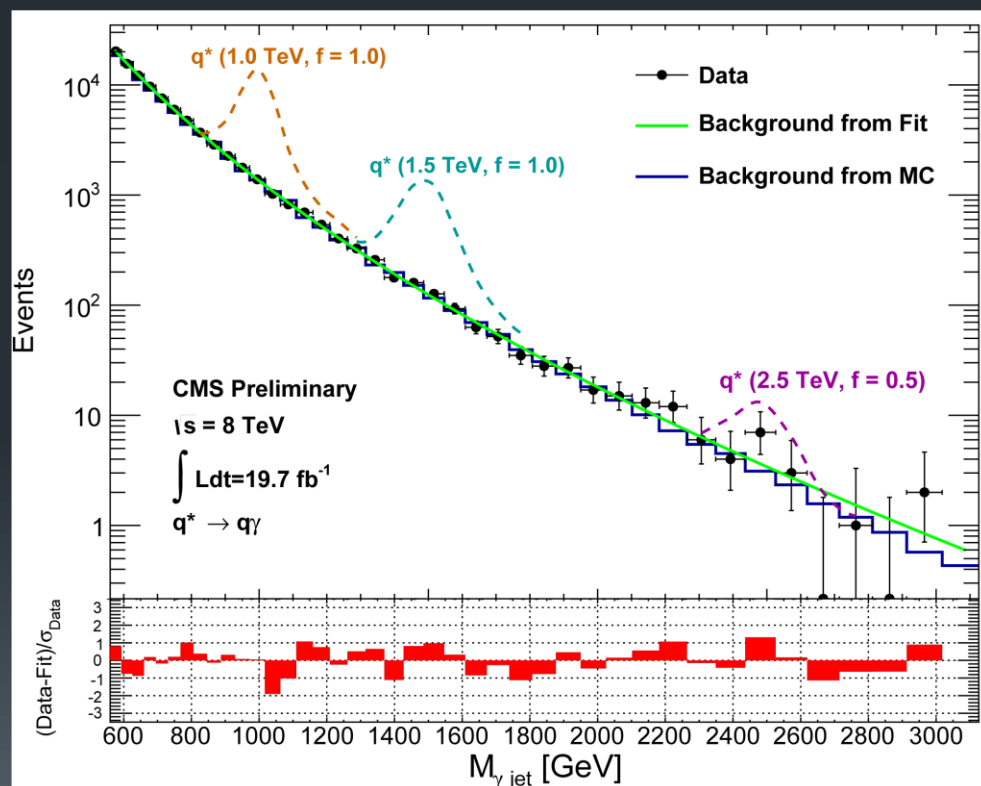


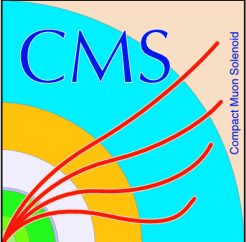
4. Exited Fermions

Excited quarks searches

16

■ $q^* \rightarrow \text{gamma} + \text{jet}$ EXO-13-003



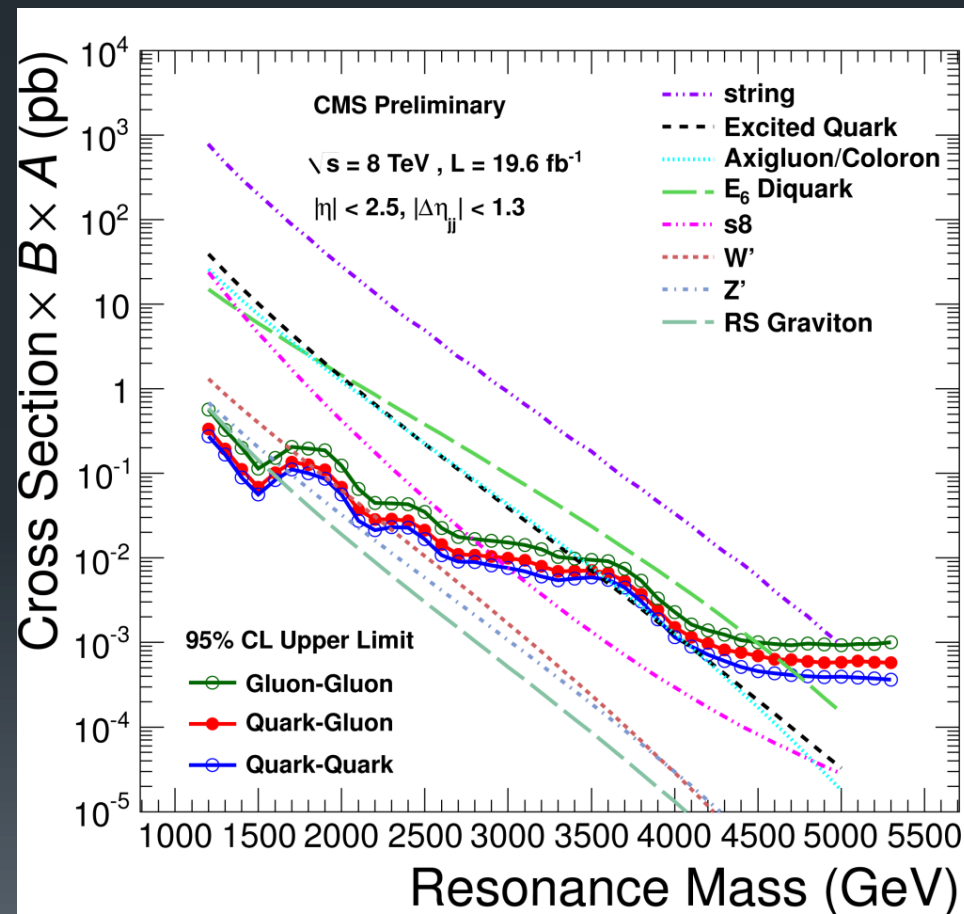
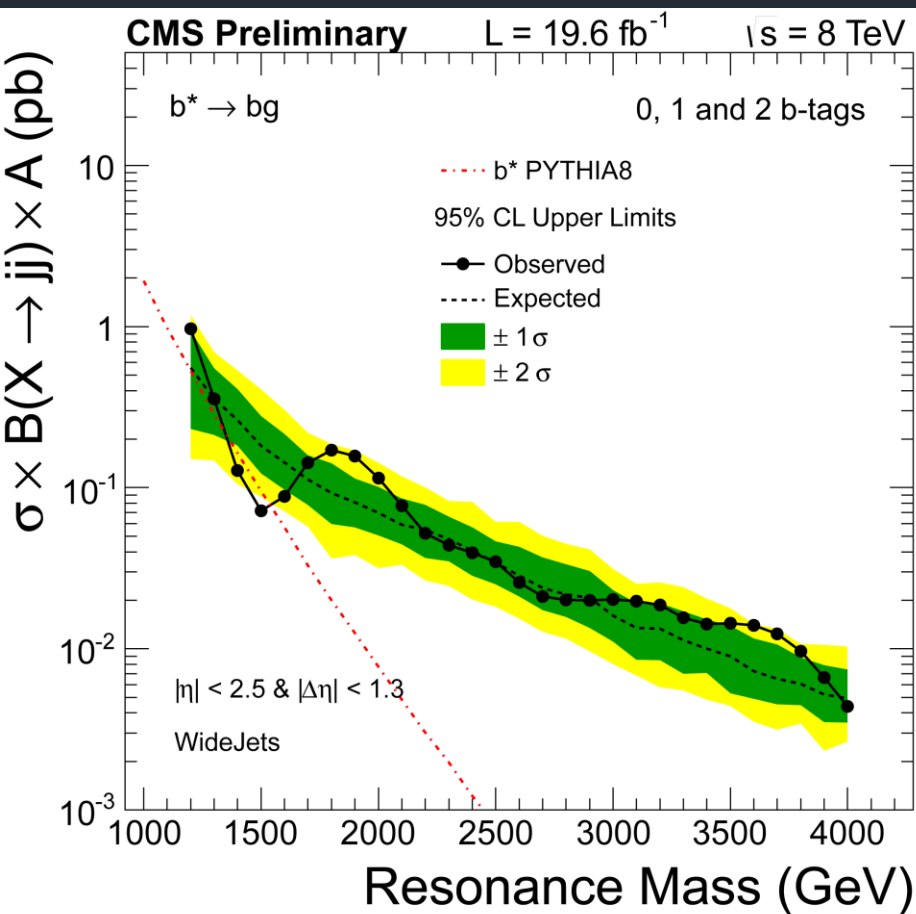


Excited quarks searches

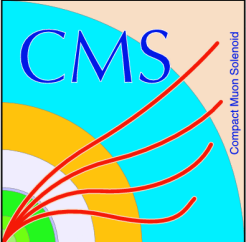
17

$q^* \rightarrow bg, \text{jet jet}$

EXO-12-023, EXO-12-059



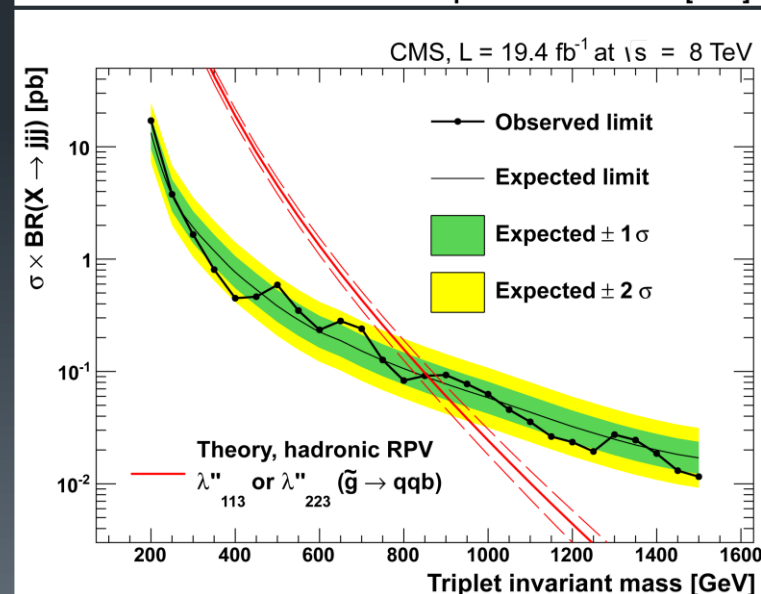
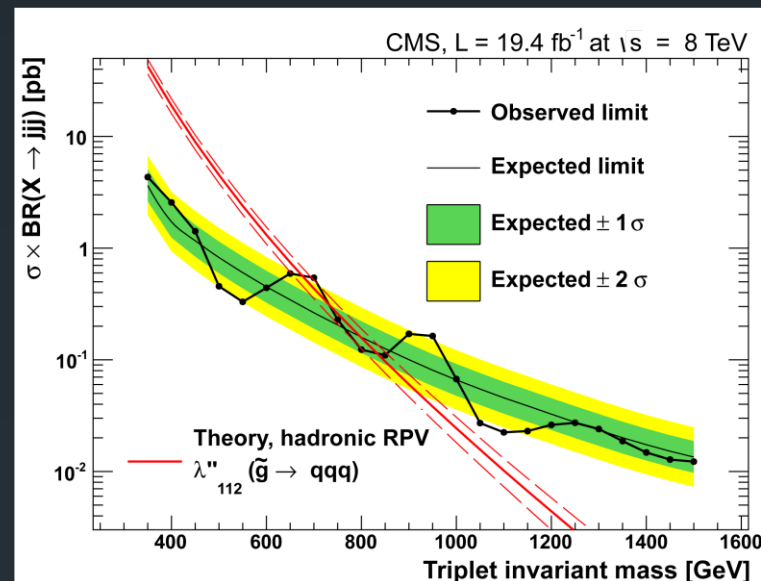
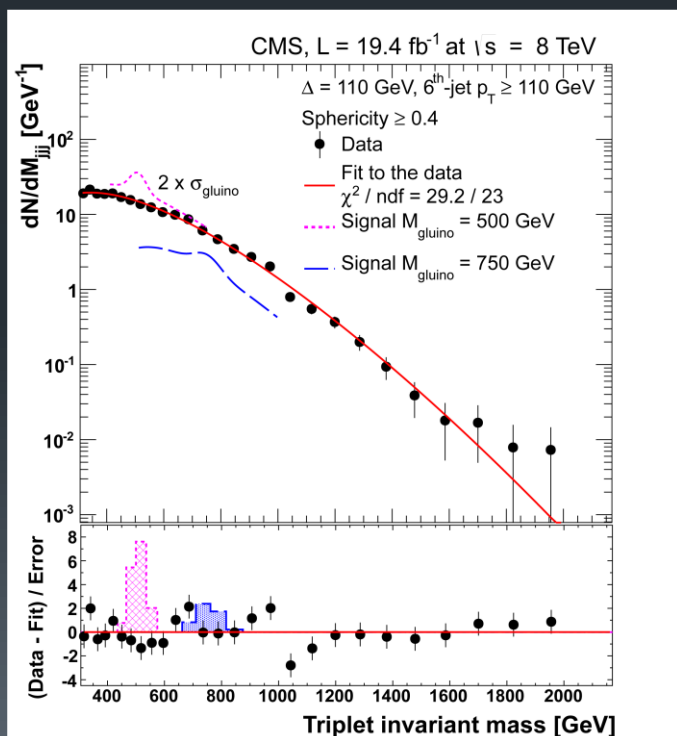
5. Multijet Resonances



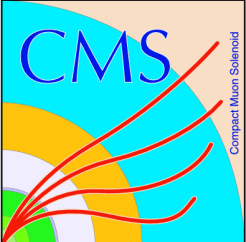
Multijet res. searches

19

- *Pair of 3-jet resonances*
- octets under $SU(3)_c$
- SUSY EXO-12-049



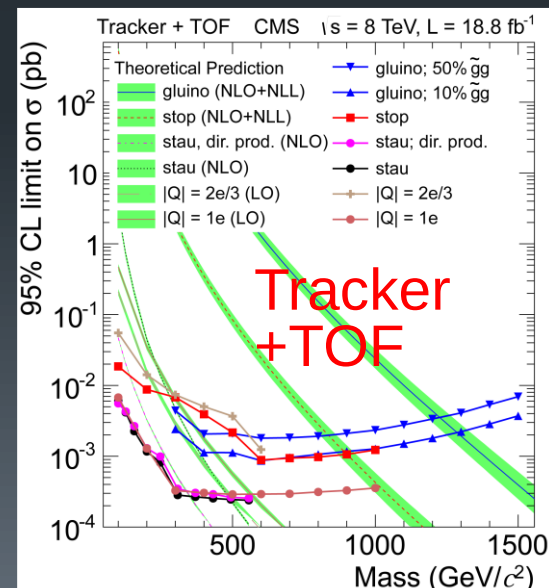
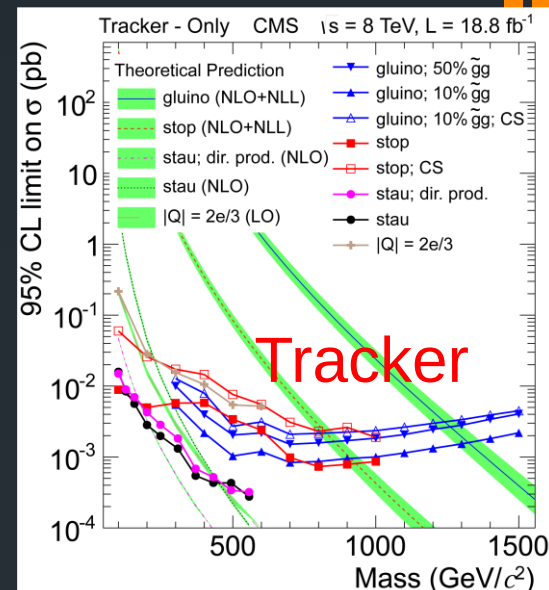
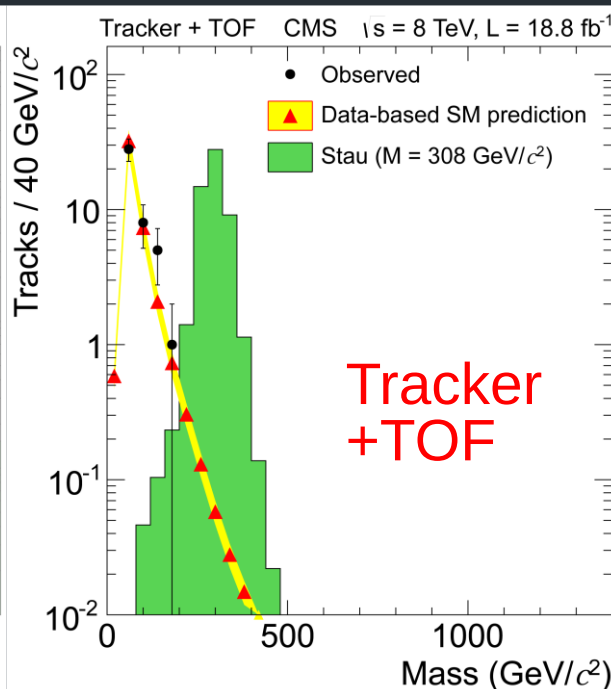
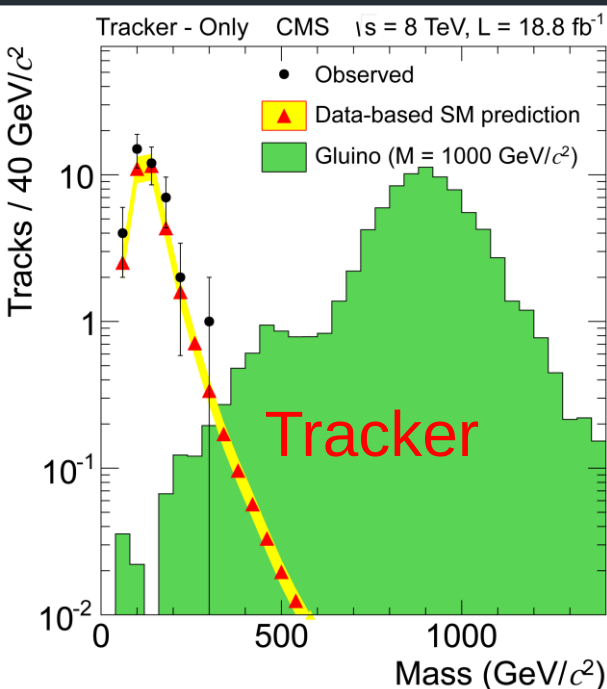
6. Long-lived particles

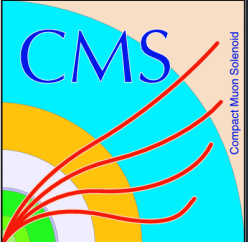


HSCP searches

21

- Low level Detector response
- SUSY and others EXO-12-026



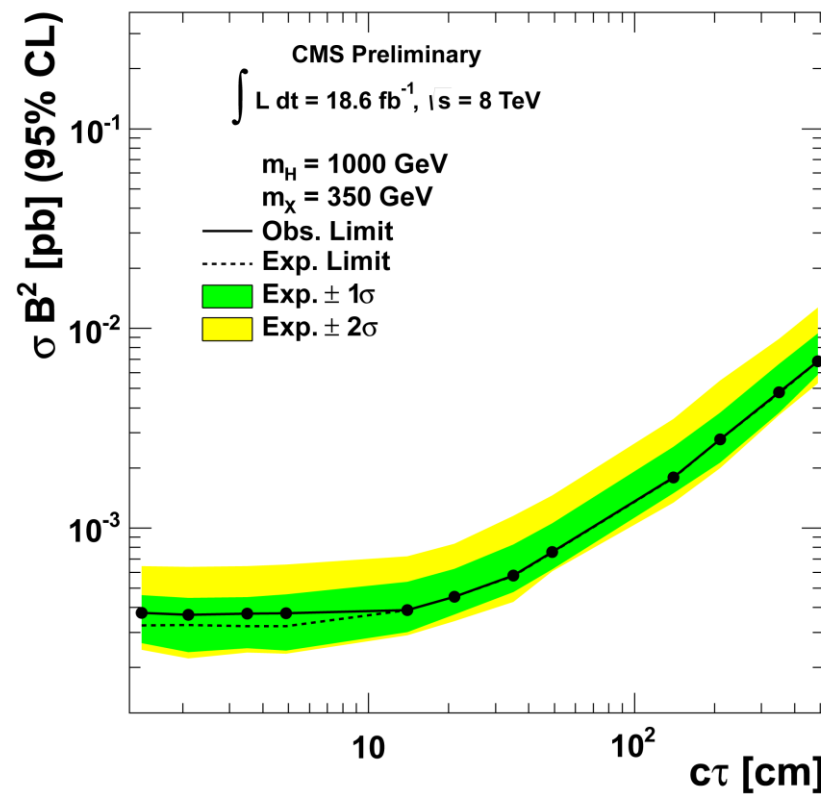
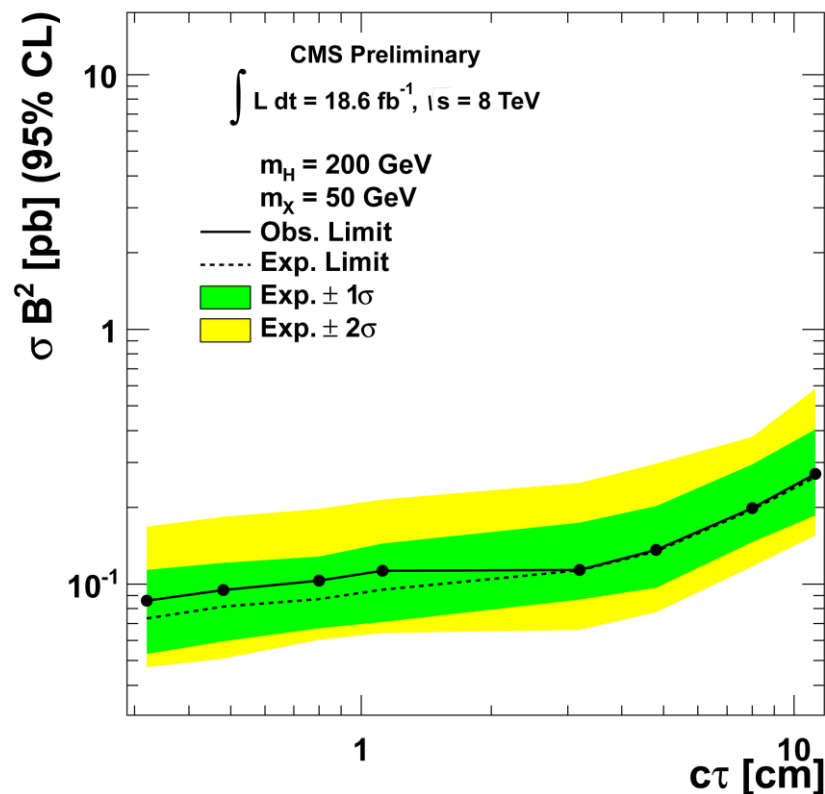


Neutral particle searches

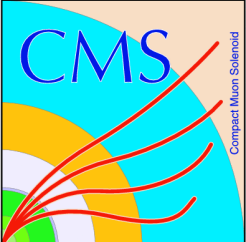
22

- *Dijet with displaced vertex*
- *SUSY, “Hidden valley” and others*

EXO-12-038



7. Dark Matter



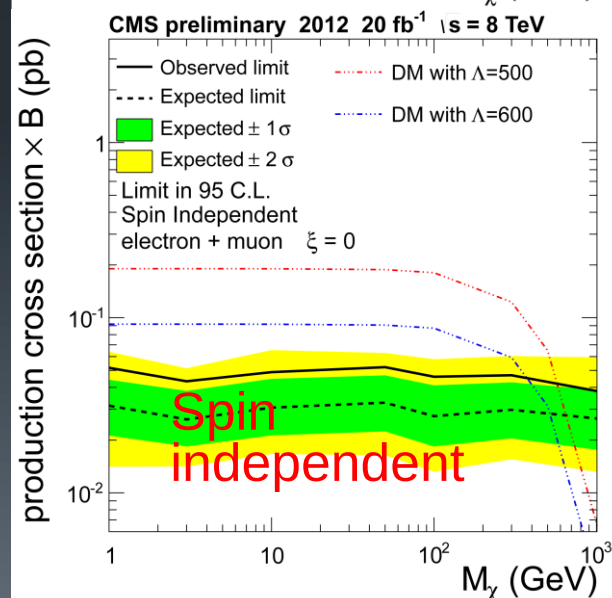
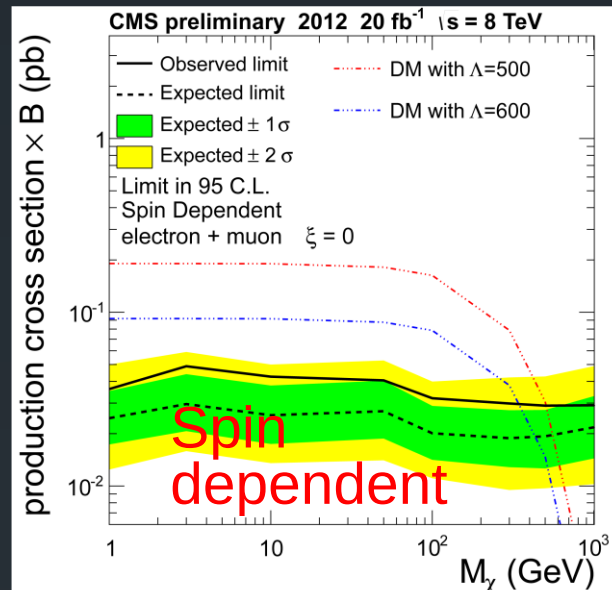
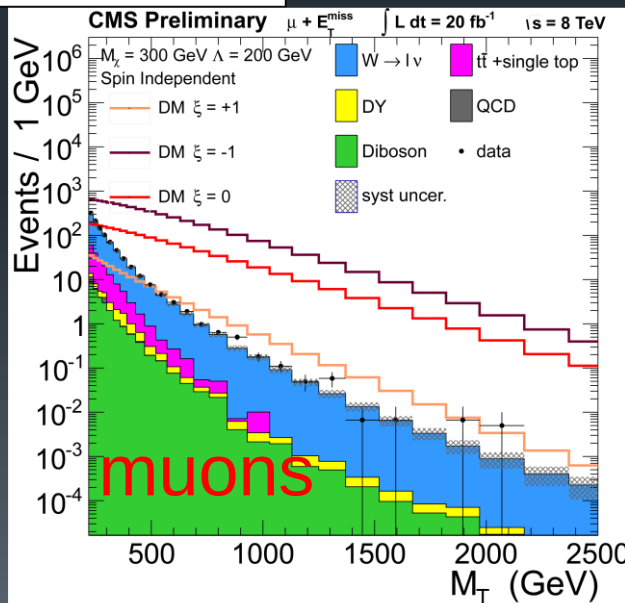
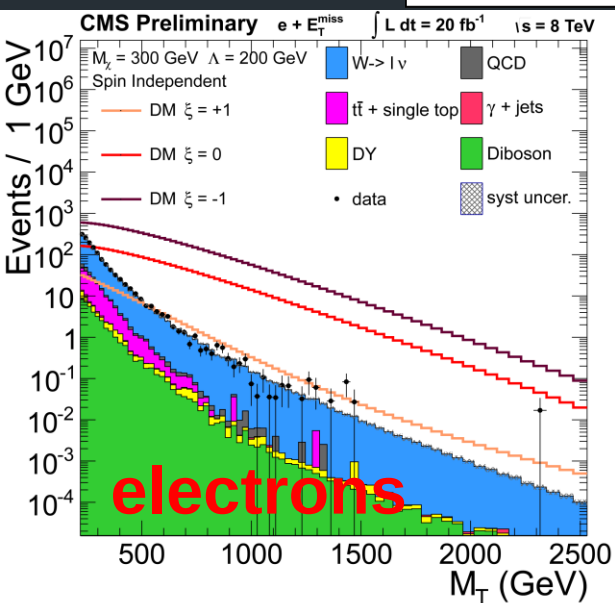
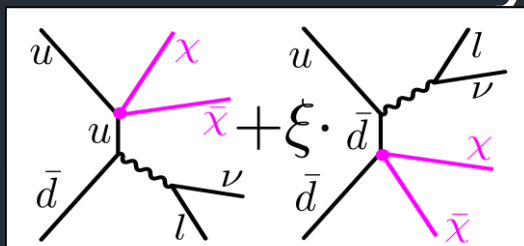
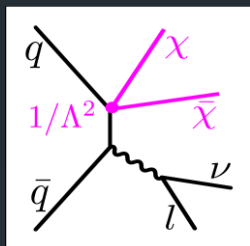
Dark Matter searches

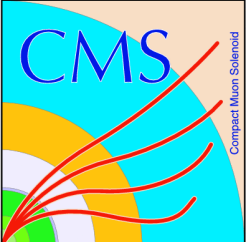
24

■ $l\nu$ (monolepton)

EXO-13-004

■ Effective Field Theory

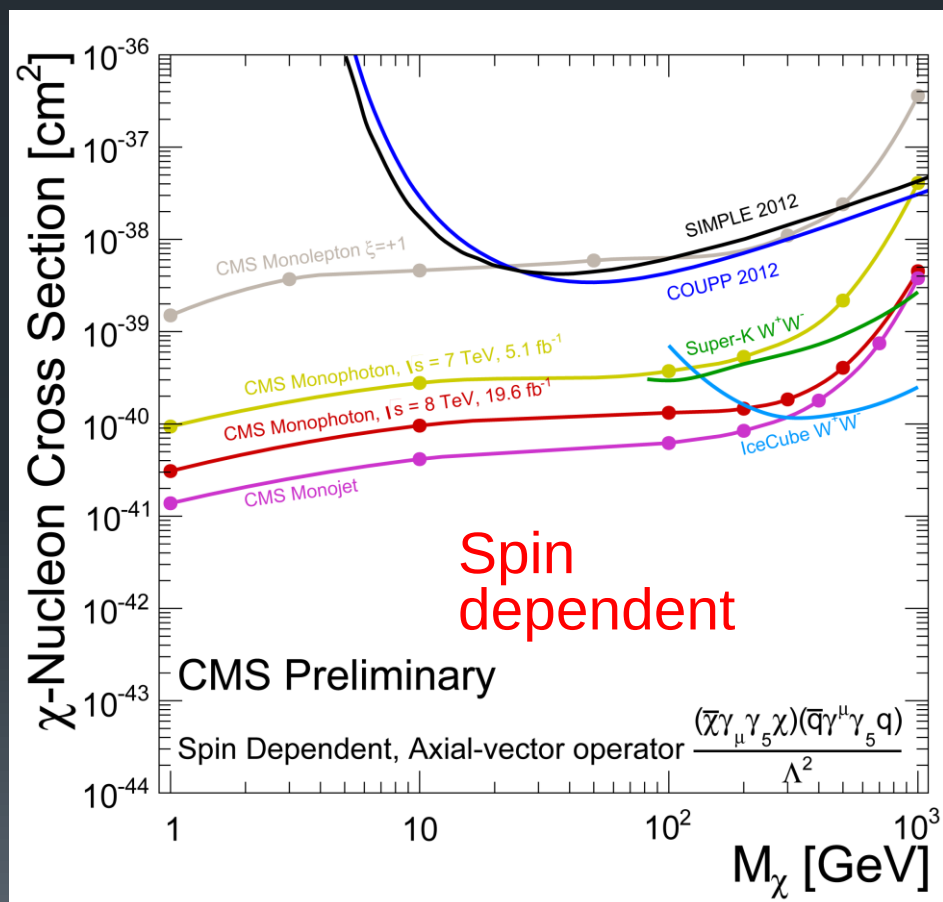
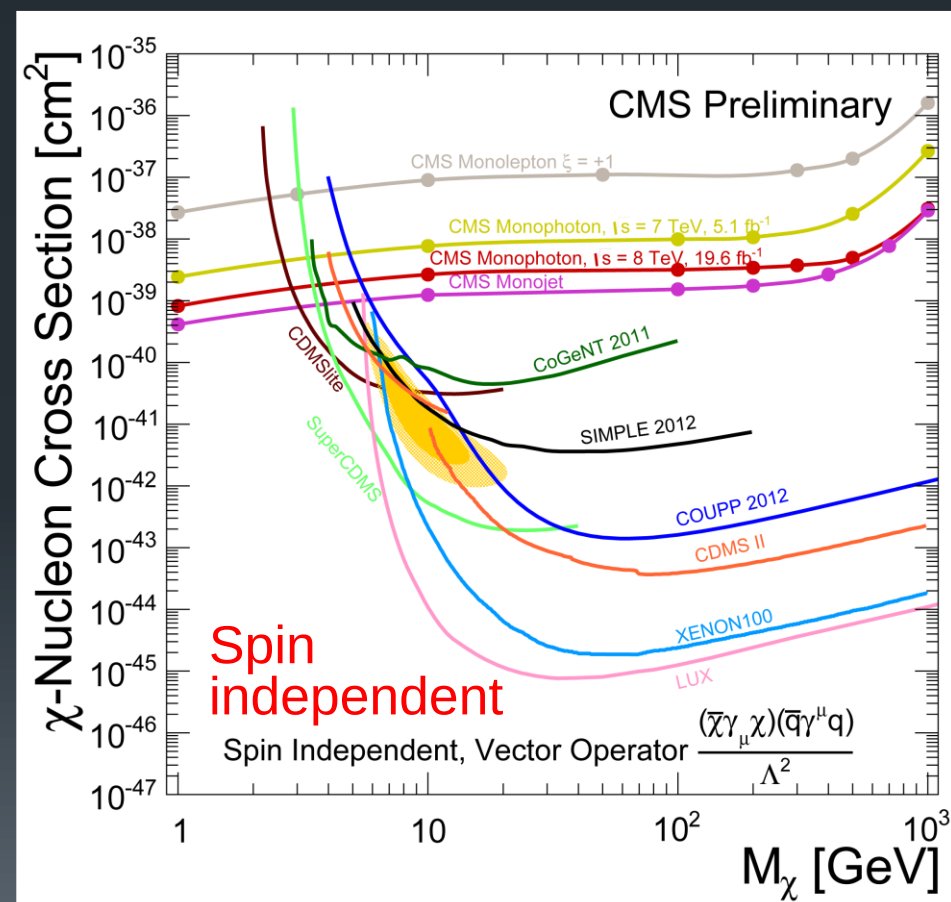




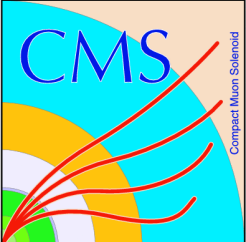
Dark Matter searches

25

- *Monophoton, Monojet* ($qq \rightarrow \gamma XX, qq \rightarrow jXX$)
EXO-12-047, EXO-12-048



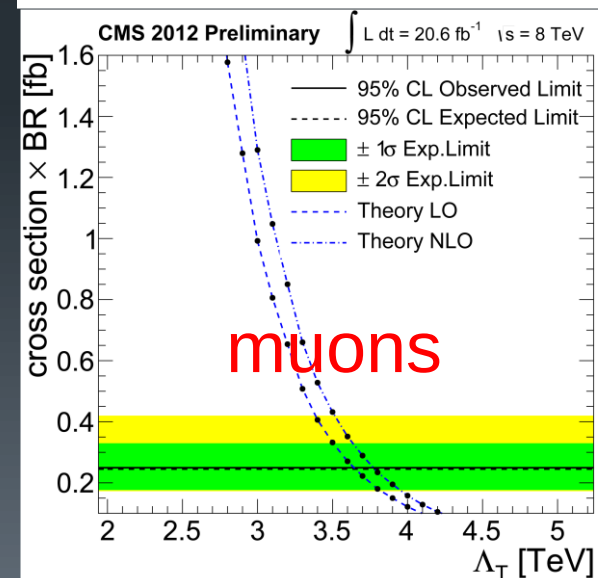
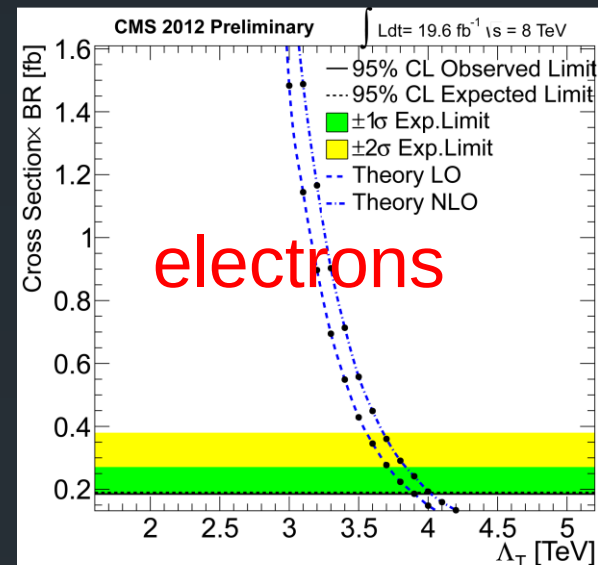
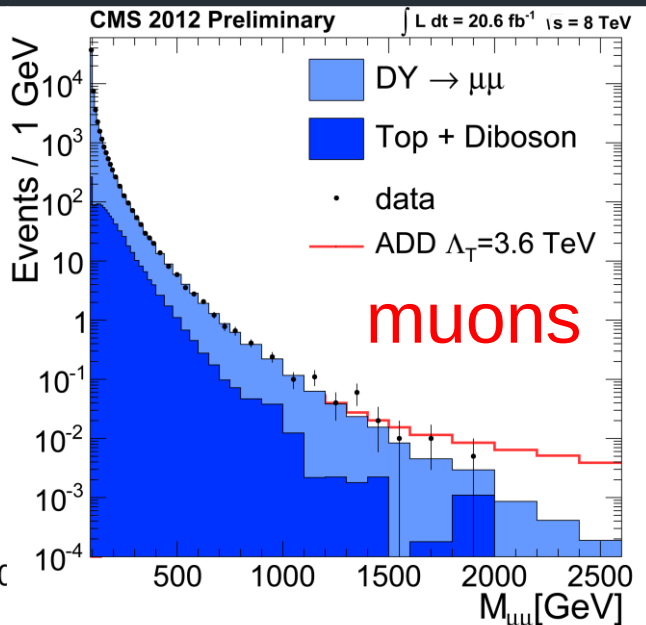
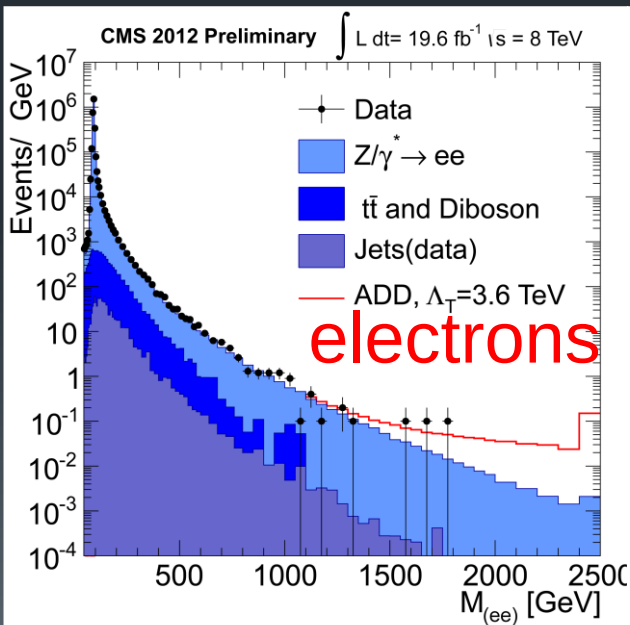
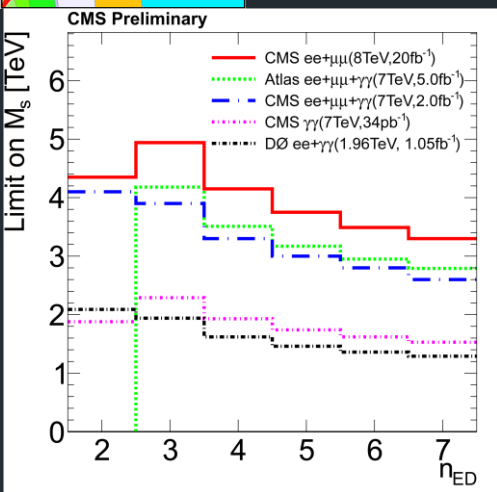
8. Large Extra Dimensions

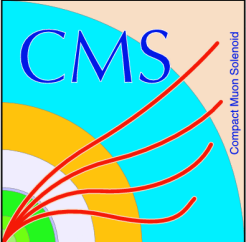


Extra Dimensions searches ²⁷

- at high invariant masses
- Arkani-Hamed–Dimopoulos–Dvali Model

EXO-12-027, EXO-12-031

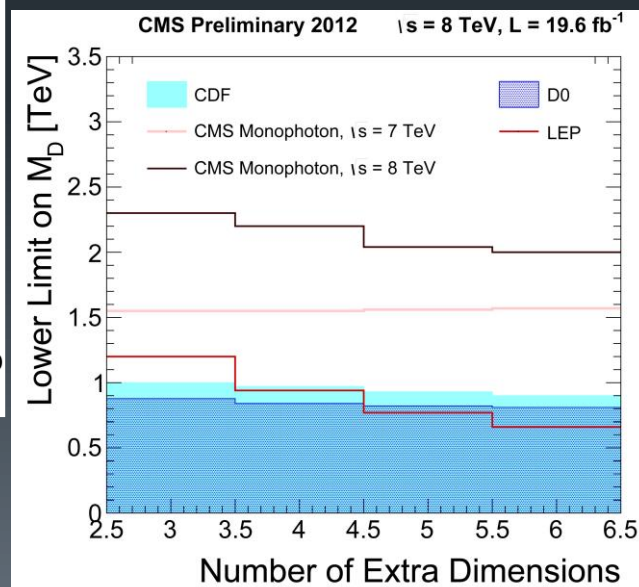
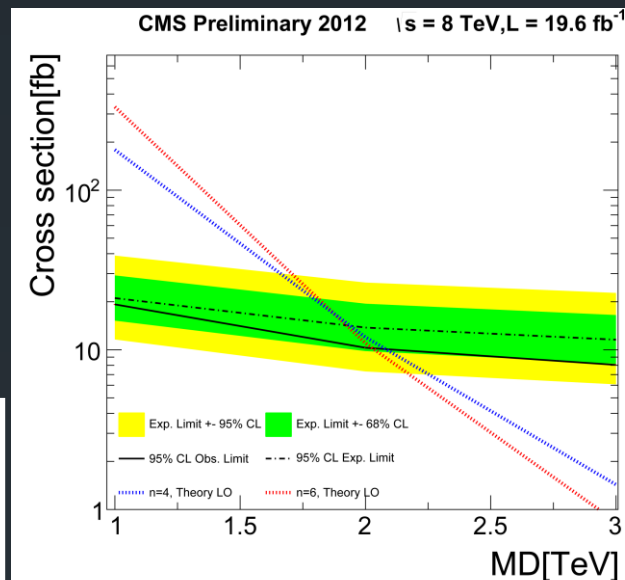
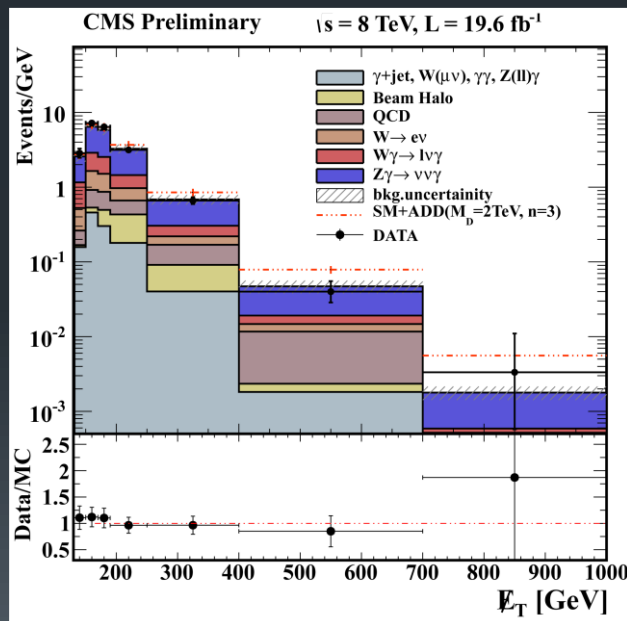
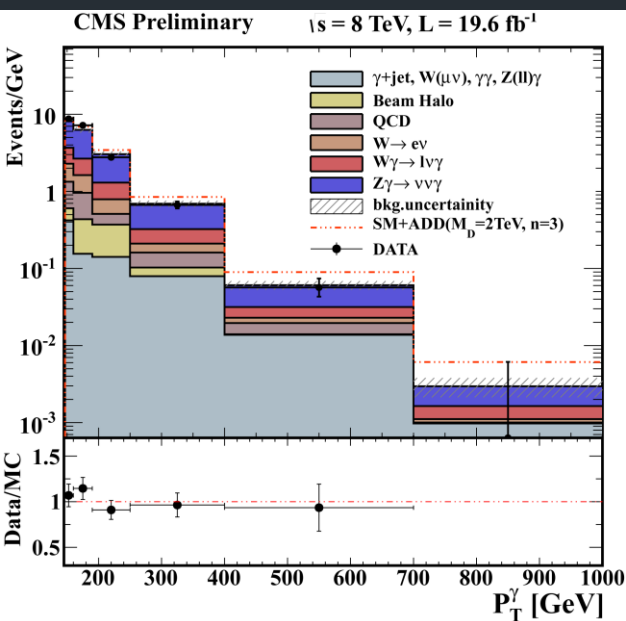


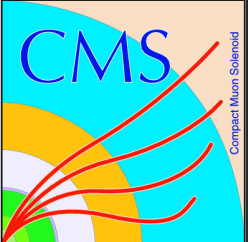


Extra Dimensions searches ²⁸

■ Monophoton

EXO-12-047

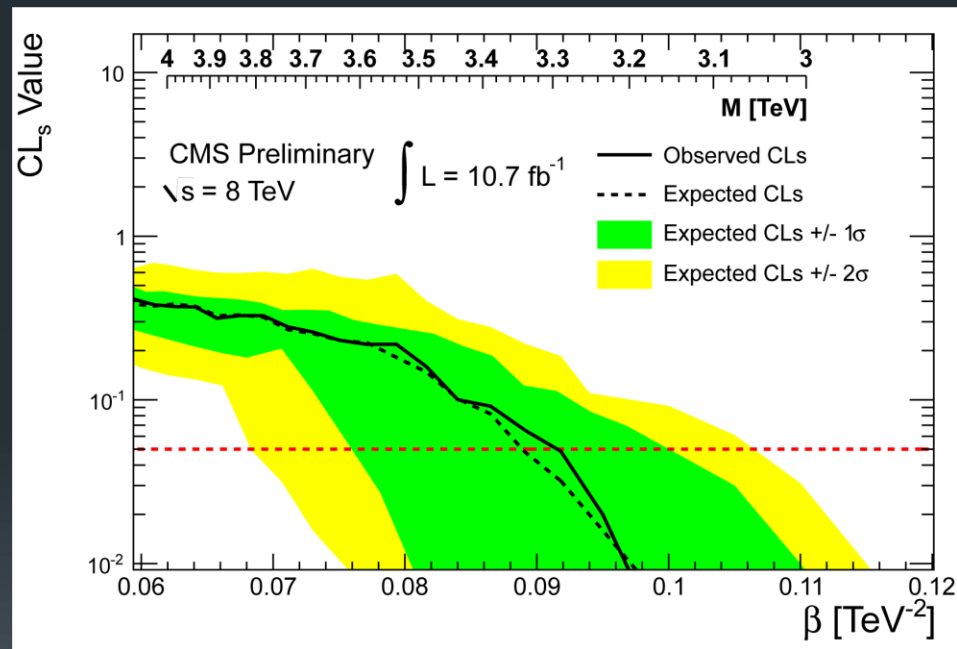
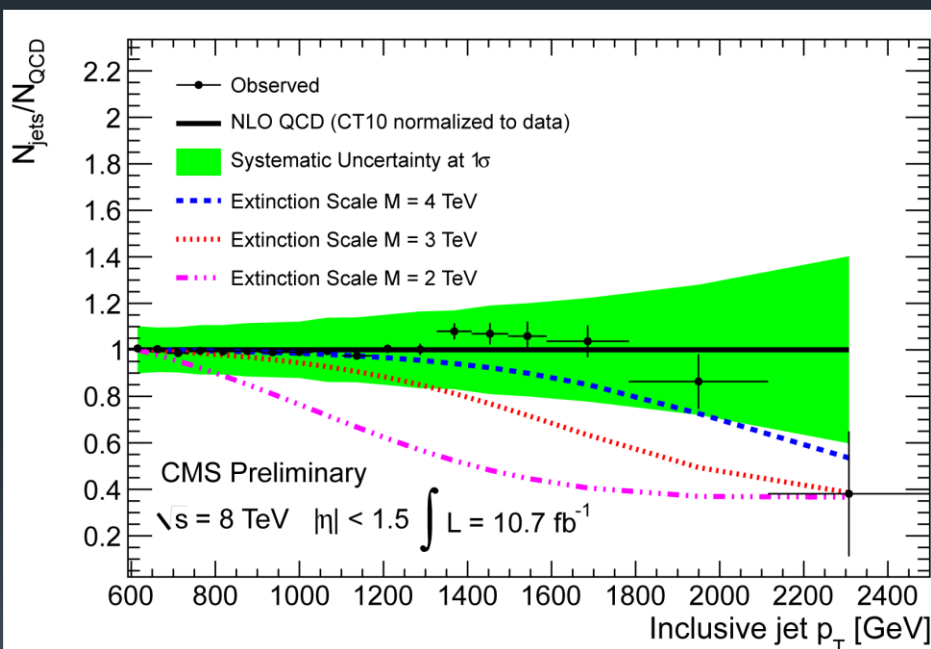




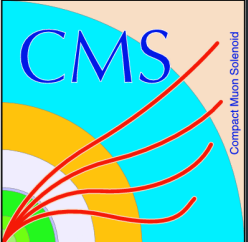
Extra Dimensions searches ²⁹

EXO-13-004

Jet extinction



9. Black Holes

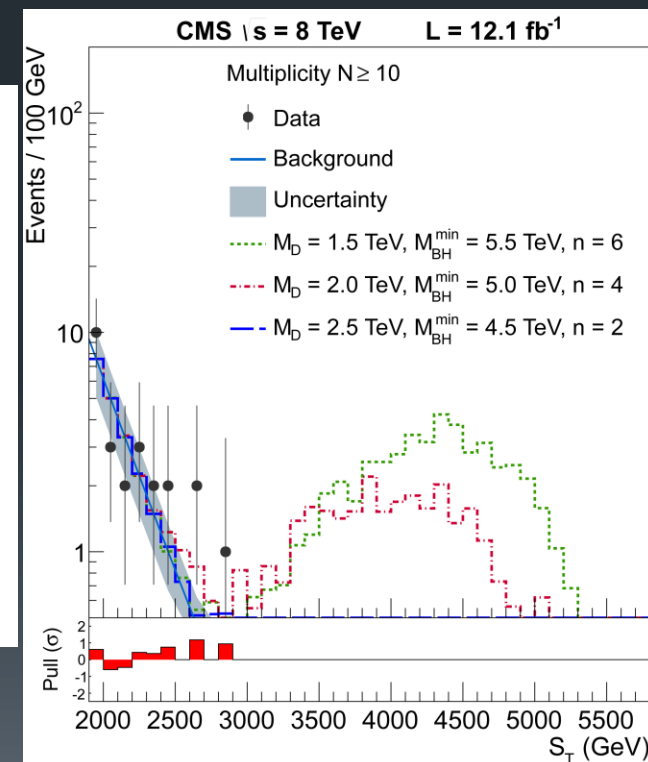
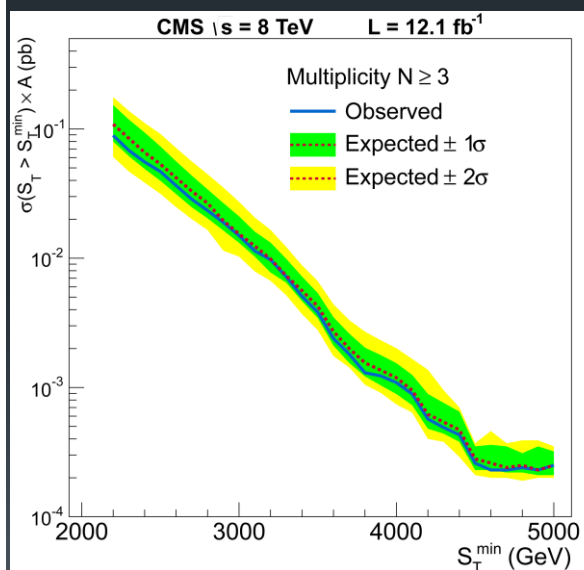
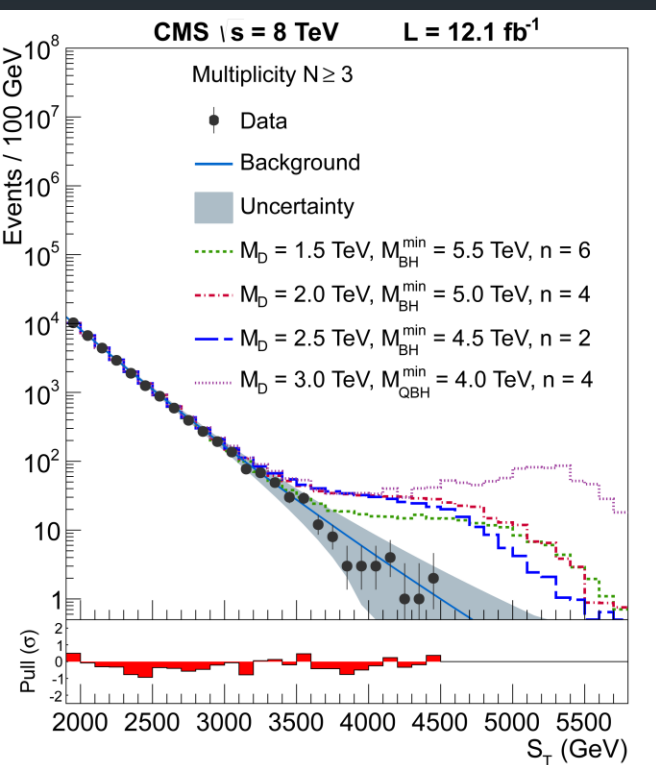


Black Holes searches

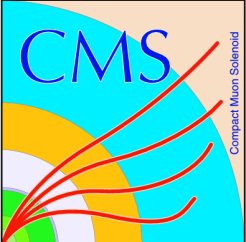
31

- *Multiparticle with high P_t*
- Model Independent

EXO-12-009

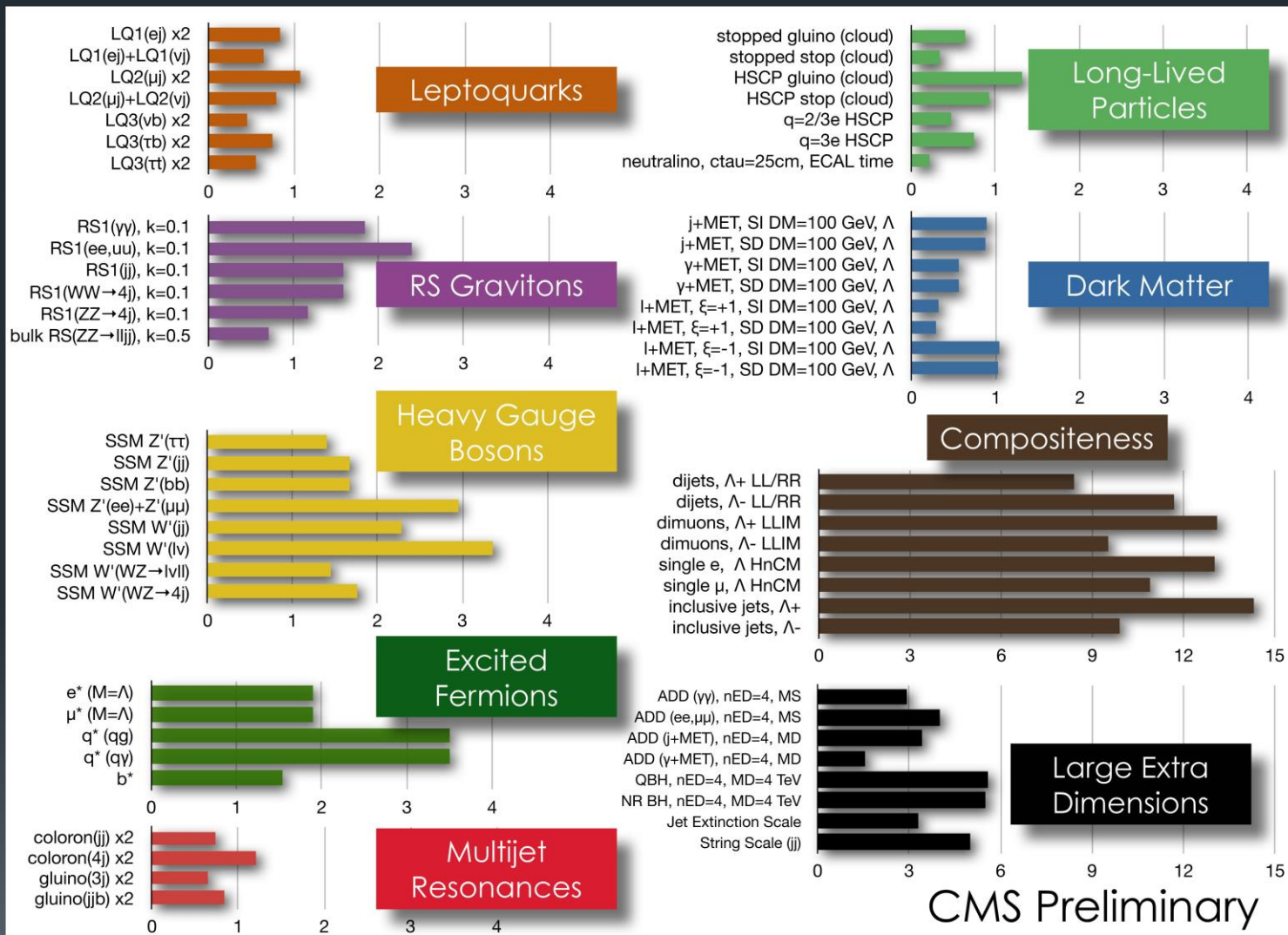


Summary



Summary

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CMS Exotica Physics Group Summary – March, 2014

Danila Tlsov, QUARKS-2014, Suzdal, Russia