The L_μ-L_τ model

Gauging the muon – tau number...

(anomaly free)

Why?

- It can address the $(g-2)_\mu$ anomaly
- It can predict the right hierarchy between neutrino masses and mixing
- Adding mirror vector-like quarks to the minimal model allows to address the anomaly in $B \to K^* \mu\mu$ (~3.5σ) seen by LHCb (1308.1707)

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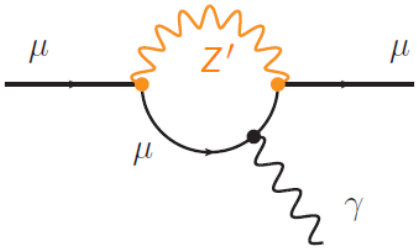

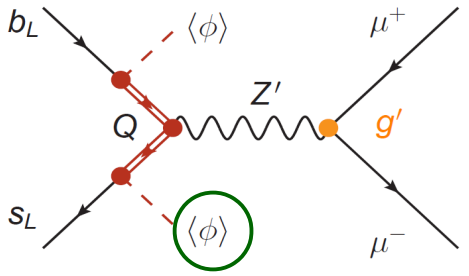

Responsible for giving mass to Z'

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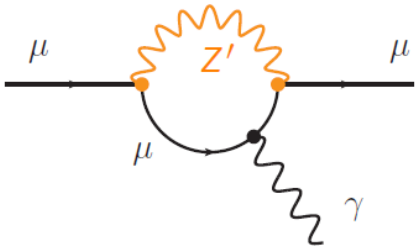
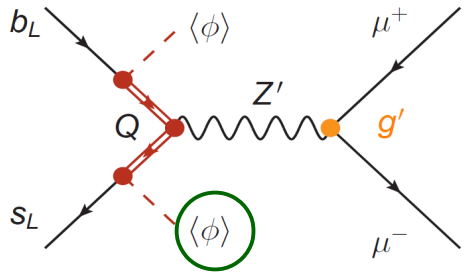




Responsible for giving mass to Z'

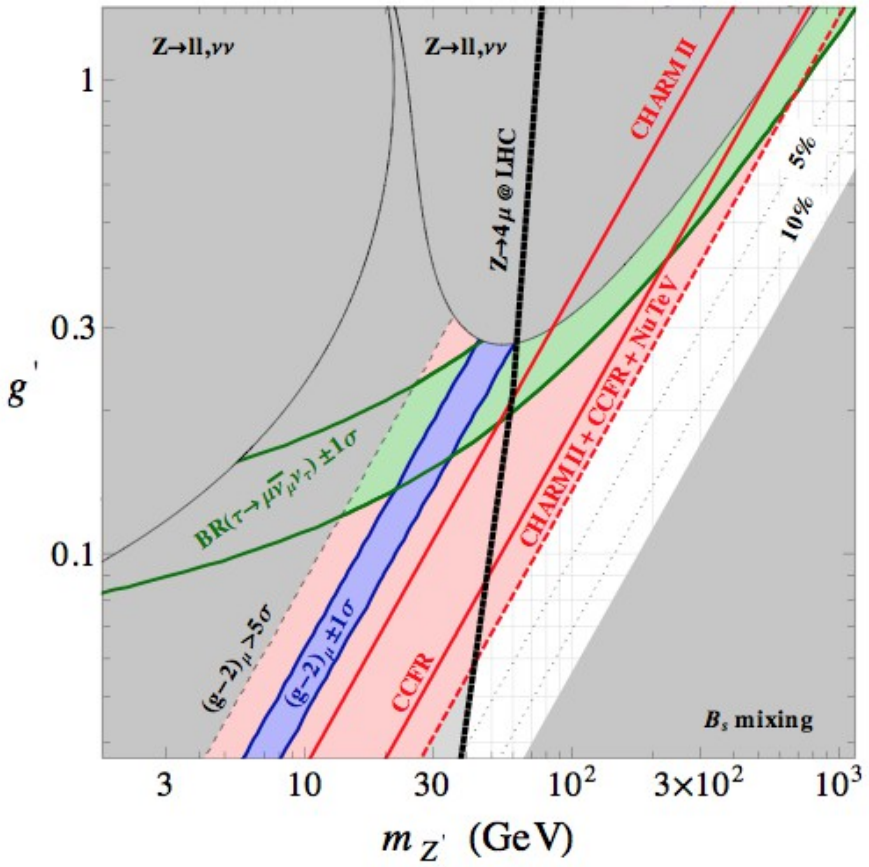
How to probe this setup?

- Z' couples to quarks only feebly.
  ➡ It might be challenging to probe it at the LHC.
- Can we use its sizable interactions with muons-taus (and corresponding neutrinos) to probe the Z' ?

Experimental probes and challenges

Gauging the muon – tau number...

Altmannshofer, SG, Pospelov, Yavin, 1403.1269, 1406.2332



High mass

Experimental probes and challenges

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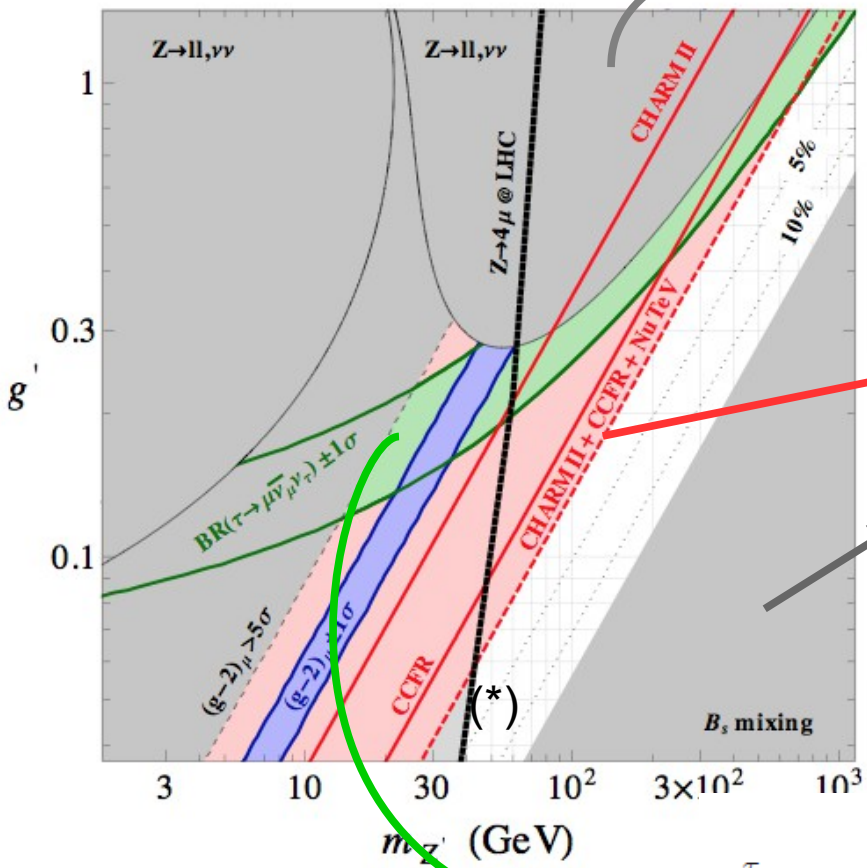
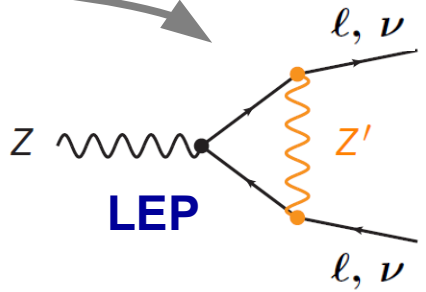
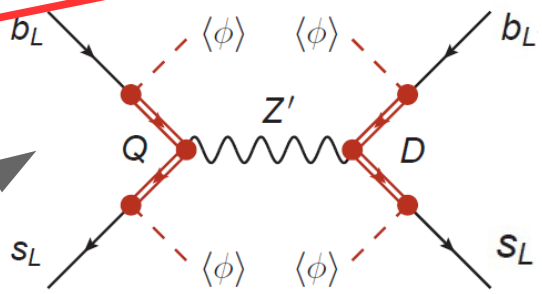


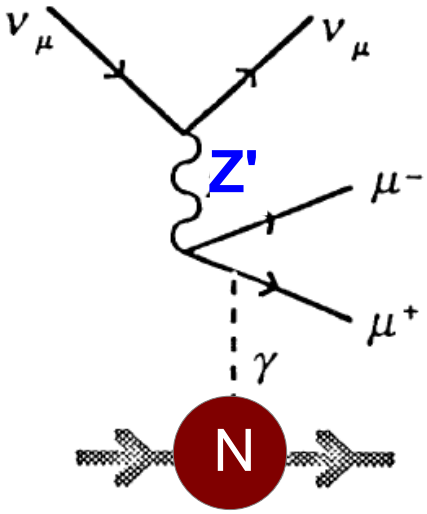


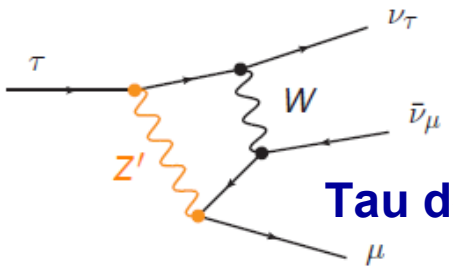
LEP



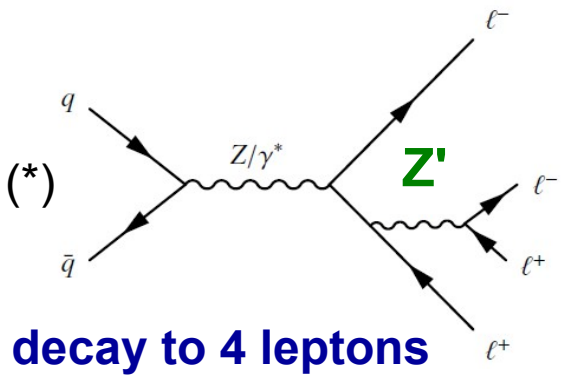
Bs mixing

Neutrino trident production





Tau decays



Z decay to 4 leptons

High mass

Experimental probes and challenges

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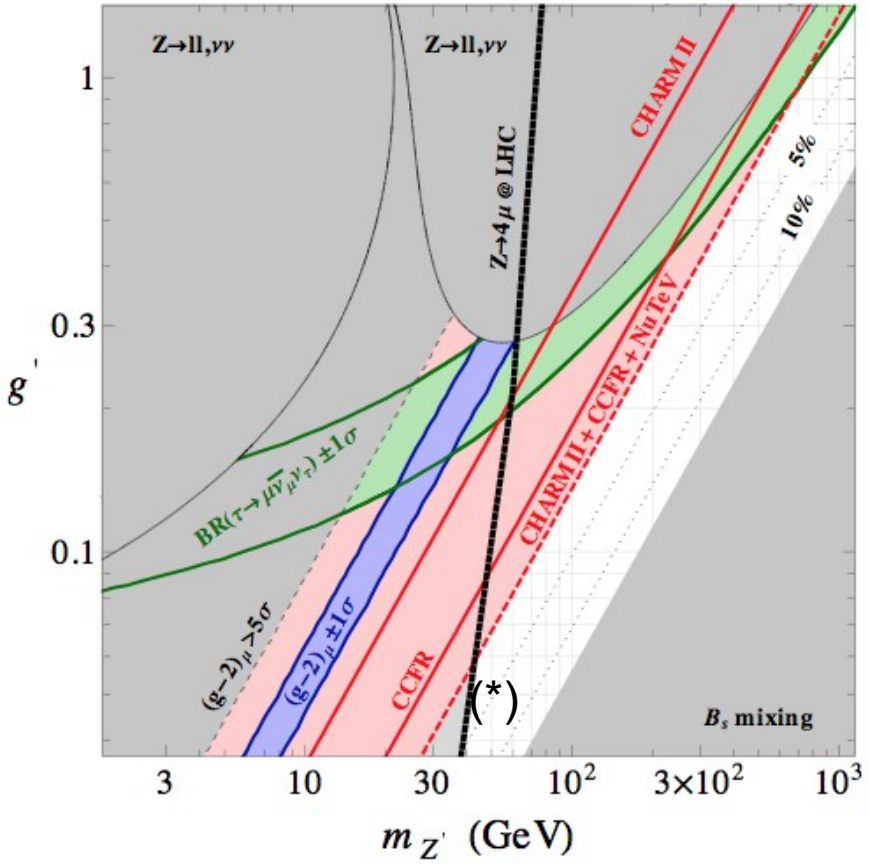

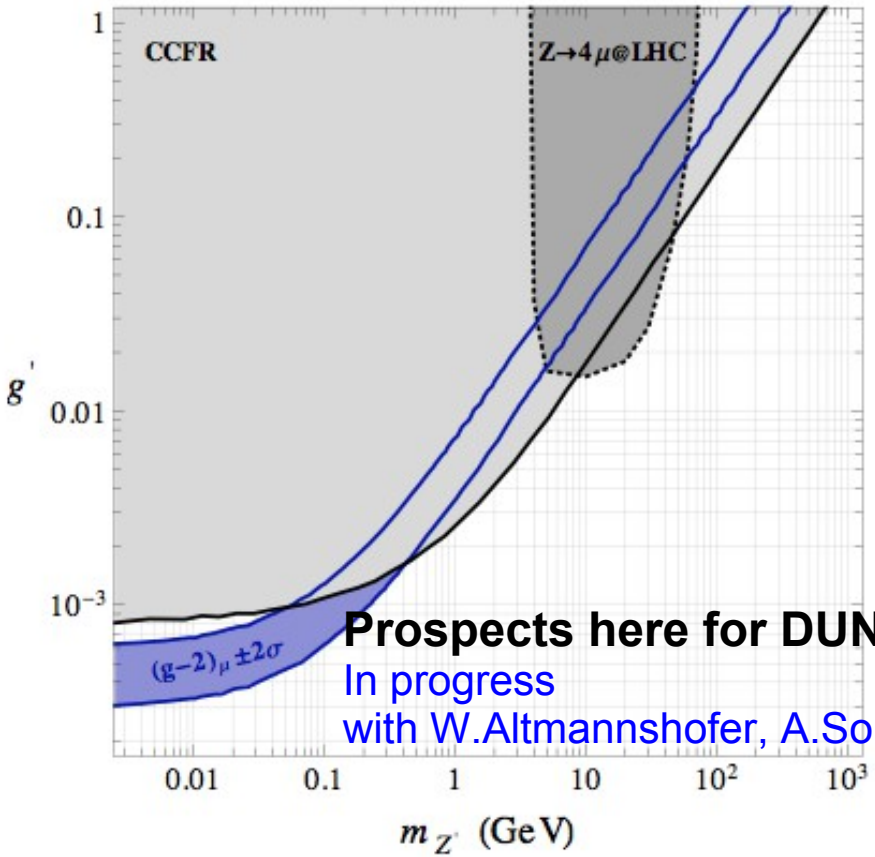

Prospects here for DUNE?
In progress
with W.Altmannshofer, A.Sousa

High mass

Low mass