

# *Electroweak Multiplets at the Muon Collider*

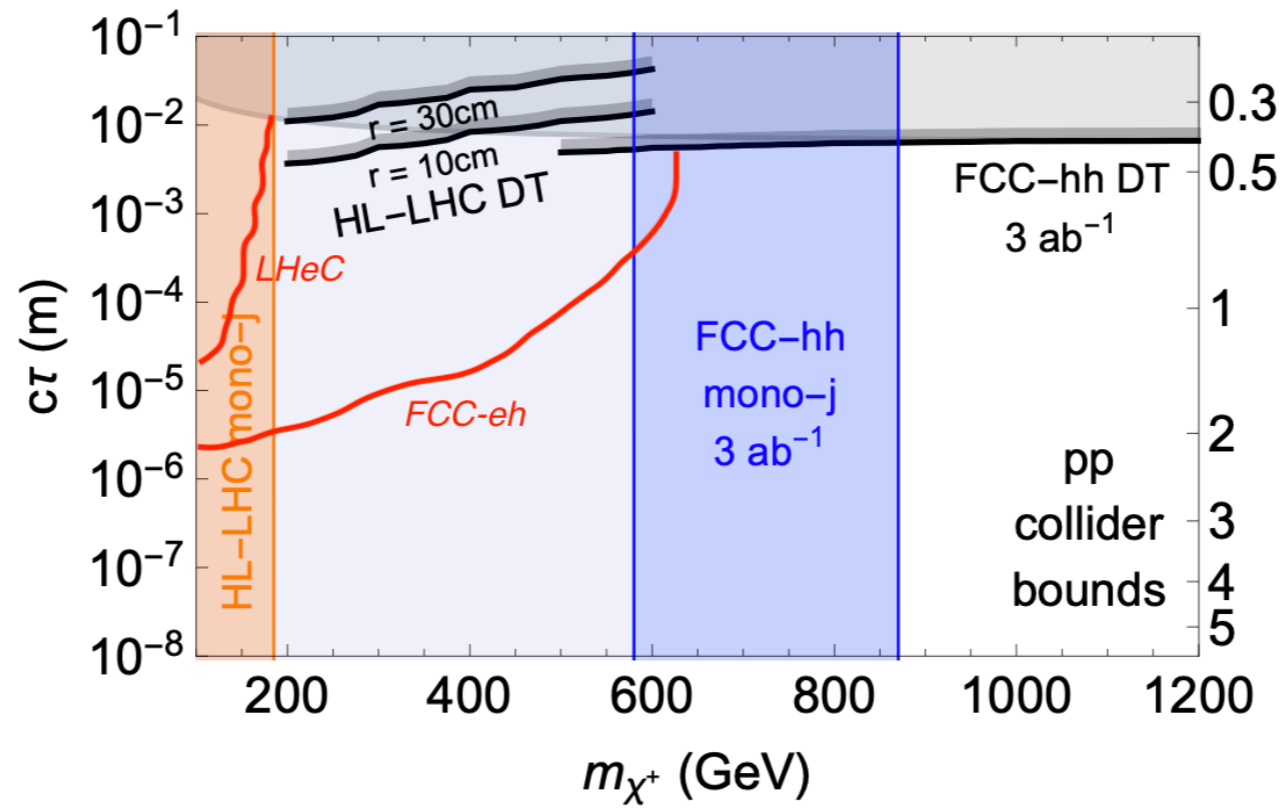
R. Capdevilla, D. Curtin, Y. Kahn, G. Krnjaic, F. Meloni, J. Zurita

Electroweak Multiplets appear in a variety of BSM models:

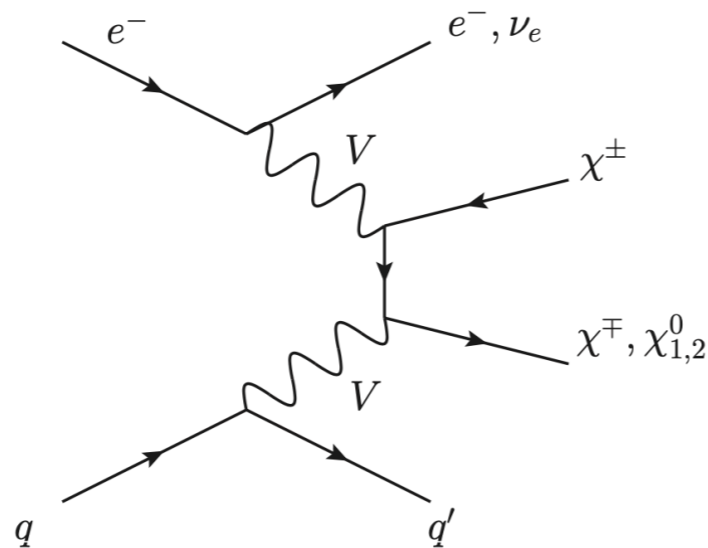
- WIMP Dark Matter, FIMP DM, Seesaw Type-III, (g-2) muon, etc.
- WIMP DM: Naturally small mass splitting between the components of the multiplet (from radiative corrections).
- Exotic signatures: Displaced vertices, Disappearing tracks.

# LLP at eP colliders

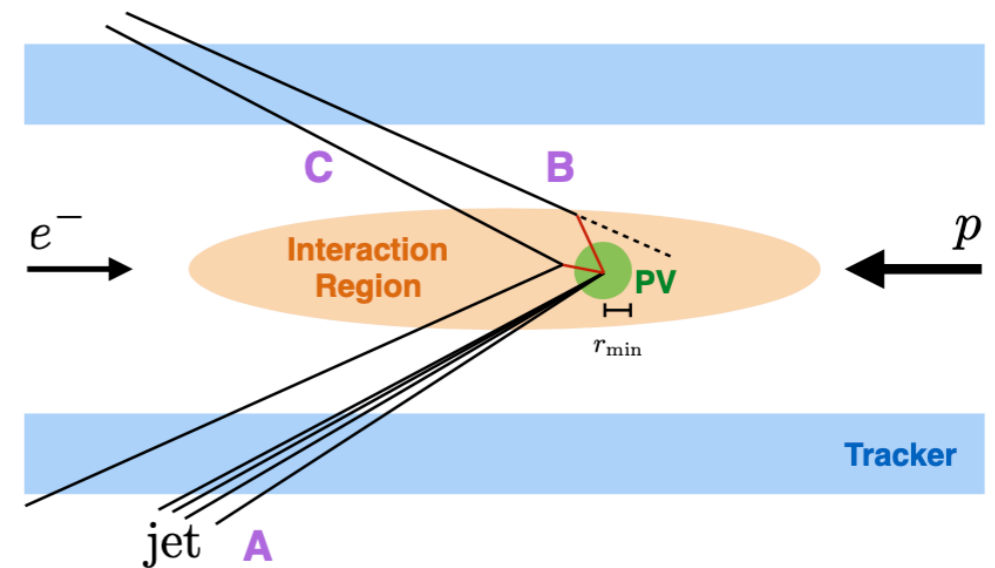
Curtin, Deshpande, Fischer, Zurita, arXiv:1712.07135



- Higher cross section

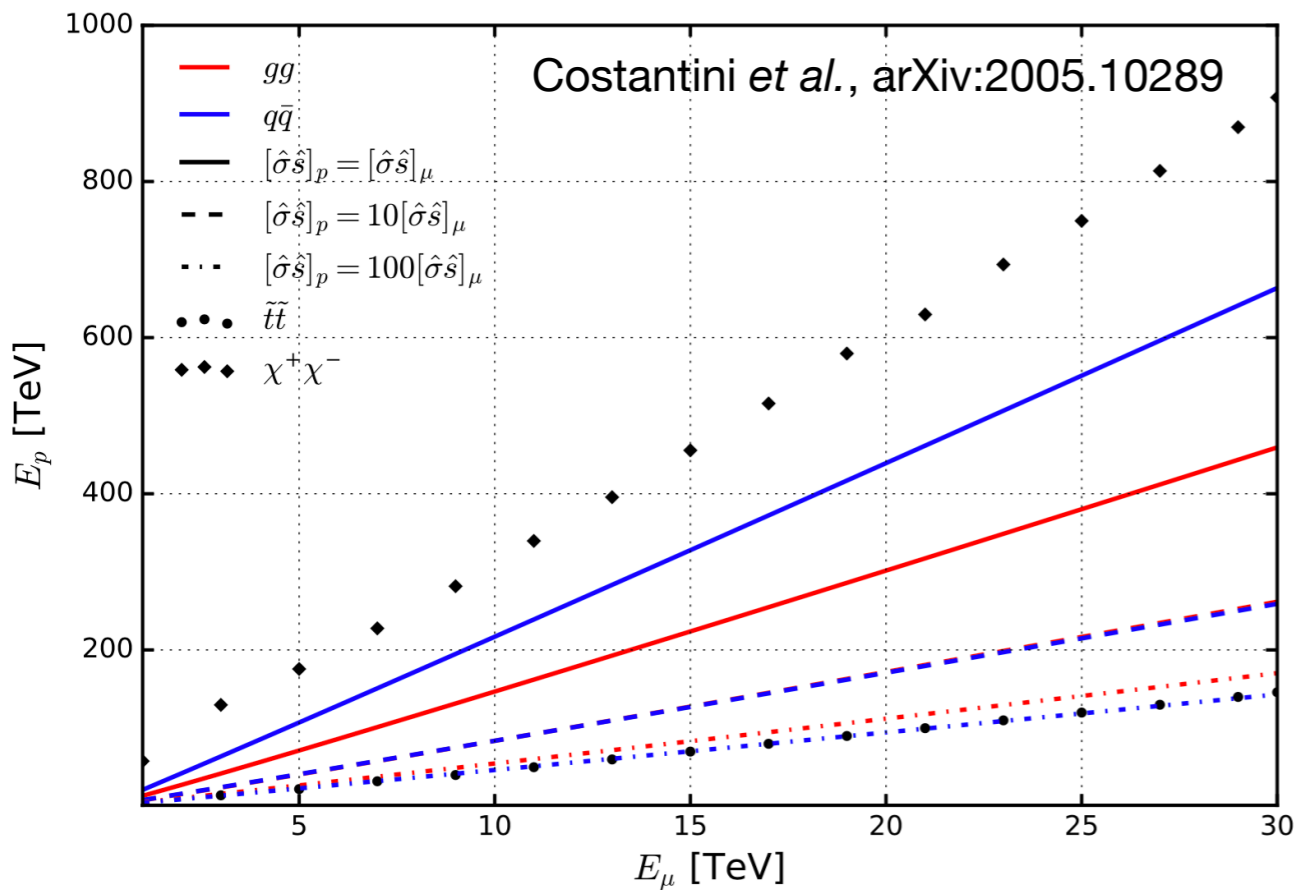


- Cleaner environment



# LLP at MuC

- Higher cross section



## Questions:

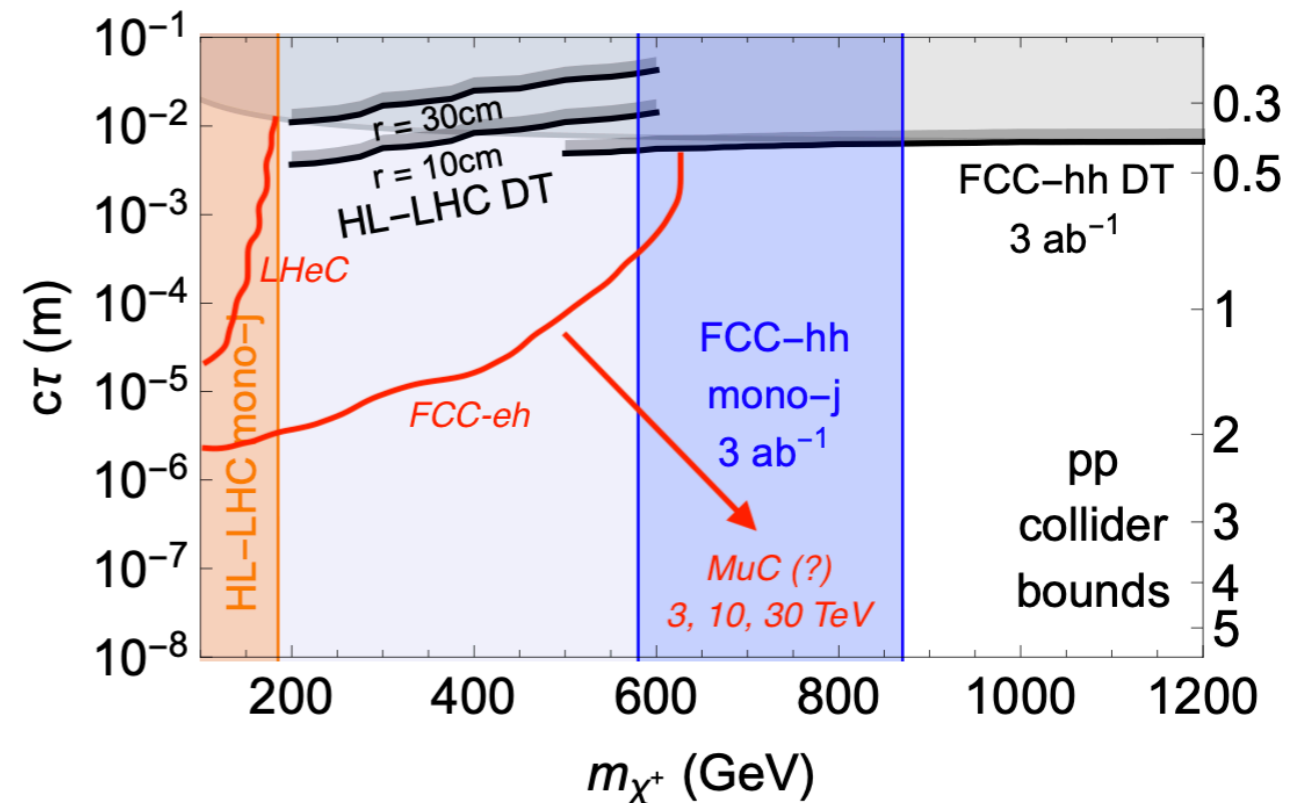
- Which detector configuration is needed to cover the thermal relic pure Higgsino WIMP?
- Can a MuC do signal characterization extracting sub-GeV mass gaps and quantum numbers of particles?
- Explore MuC detector designs; MAP vs LEMMA?

- Cleaner environment (?)

Challenges due to Beam-induced backgrounds

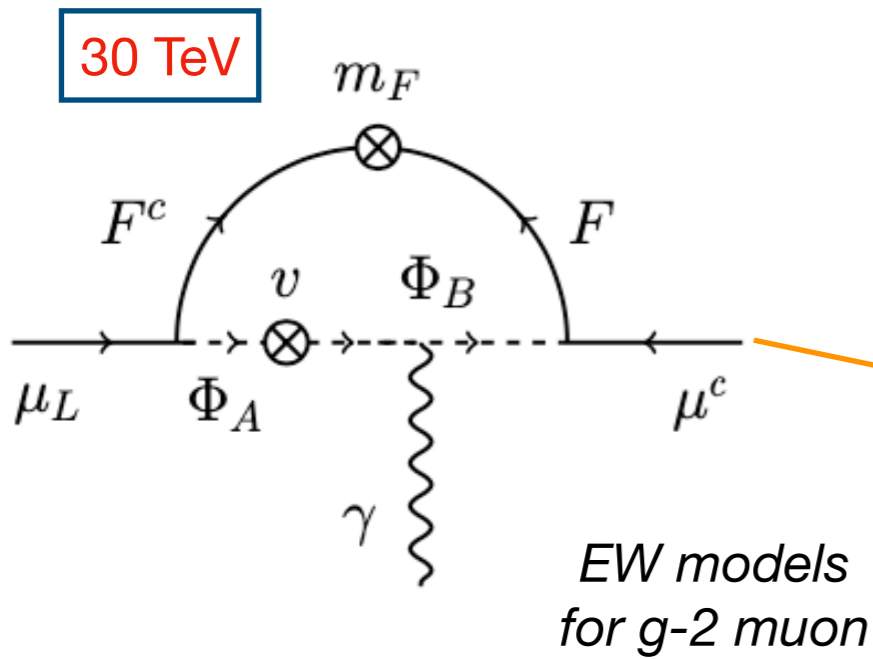
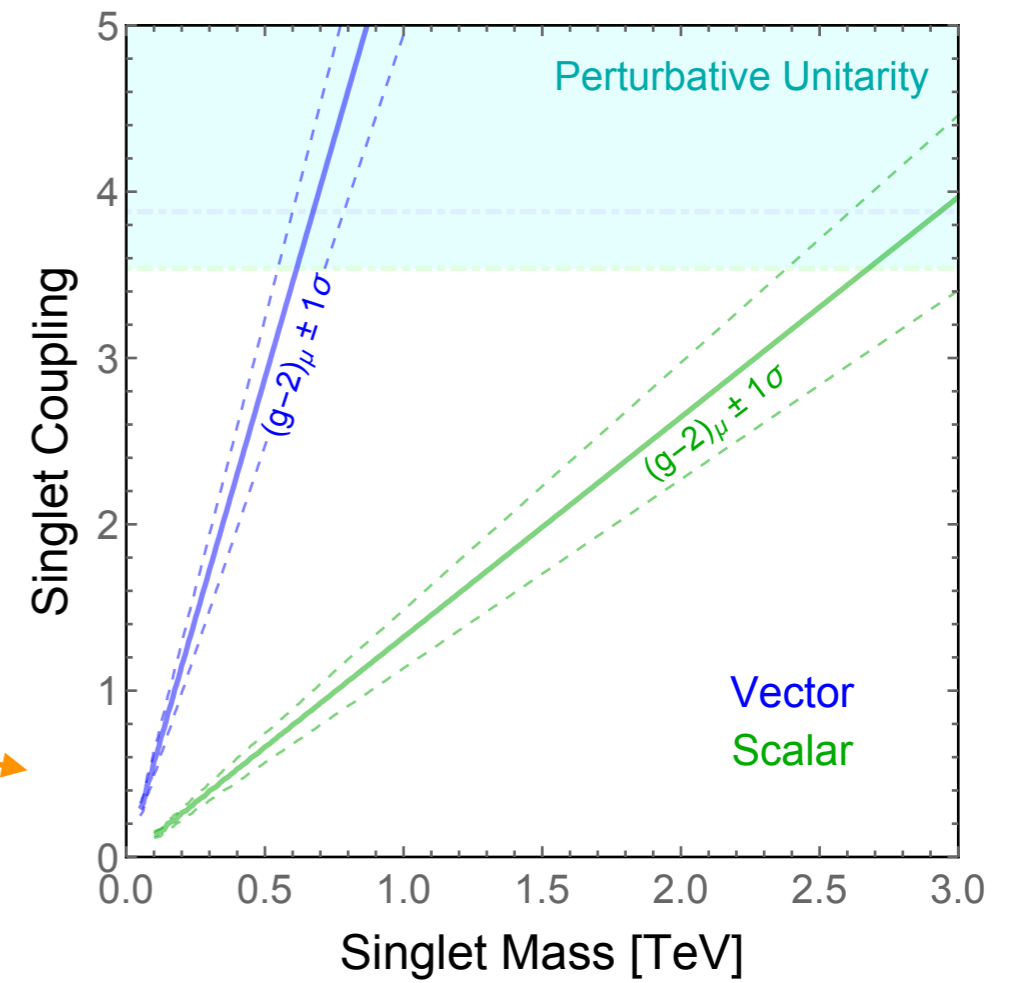
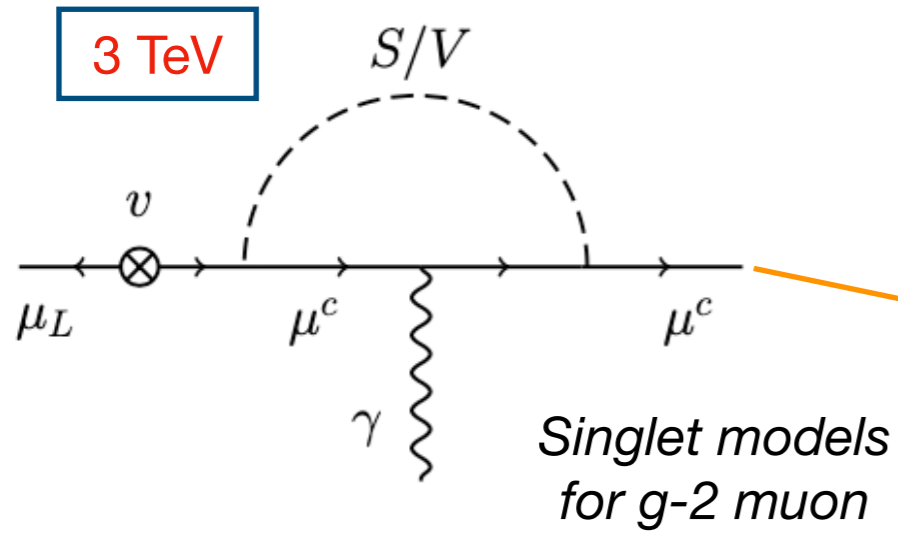
Potential solutions:

- Kinematic cuts
- Timing information
- Tracking reconstruction algorithms
- More...

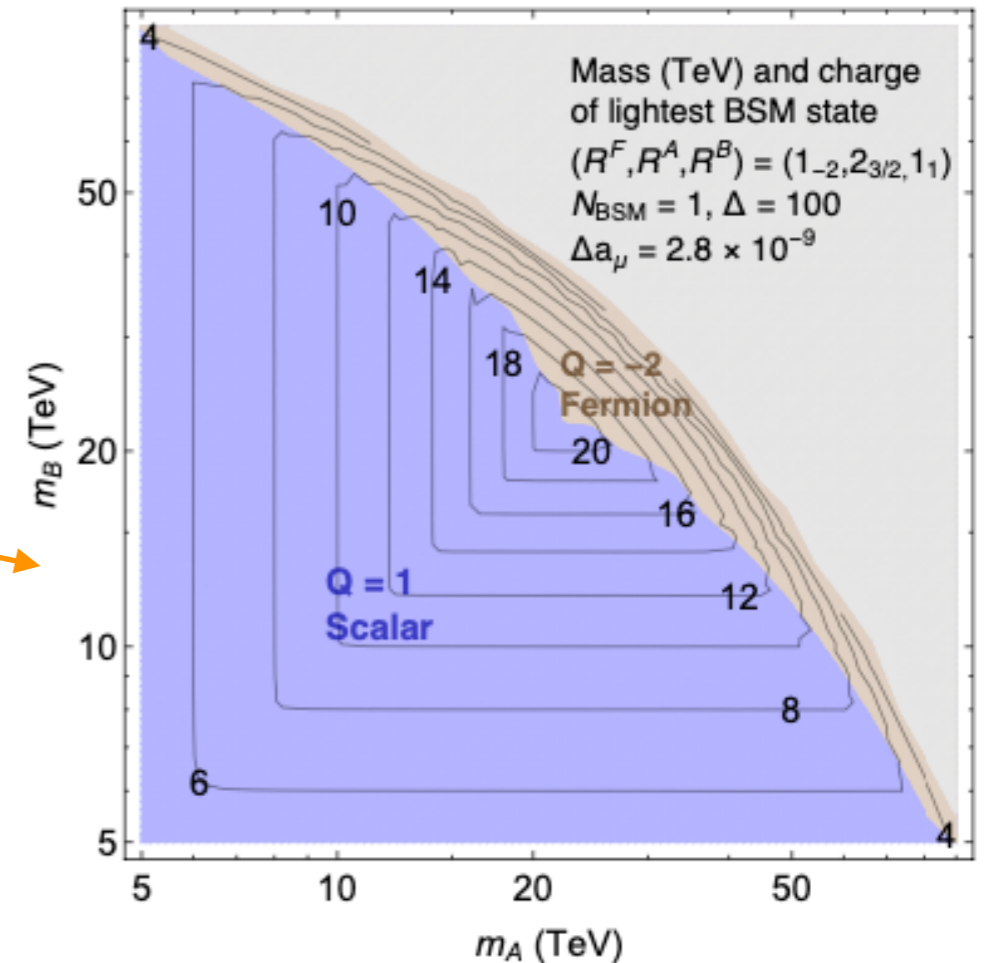


# Bonus

Capdevilla, Curtin, Kahn, Krnjaic, arXiv:2006.16277



If  $g-2$  muon is confirmed as a new physics effect, then a discovery is guaranteed



***Thanks!***