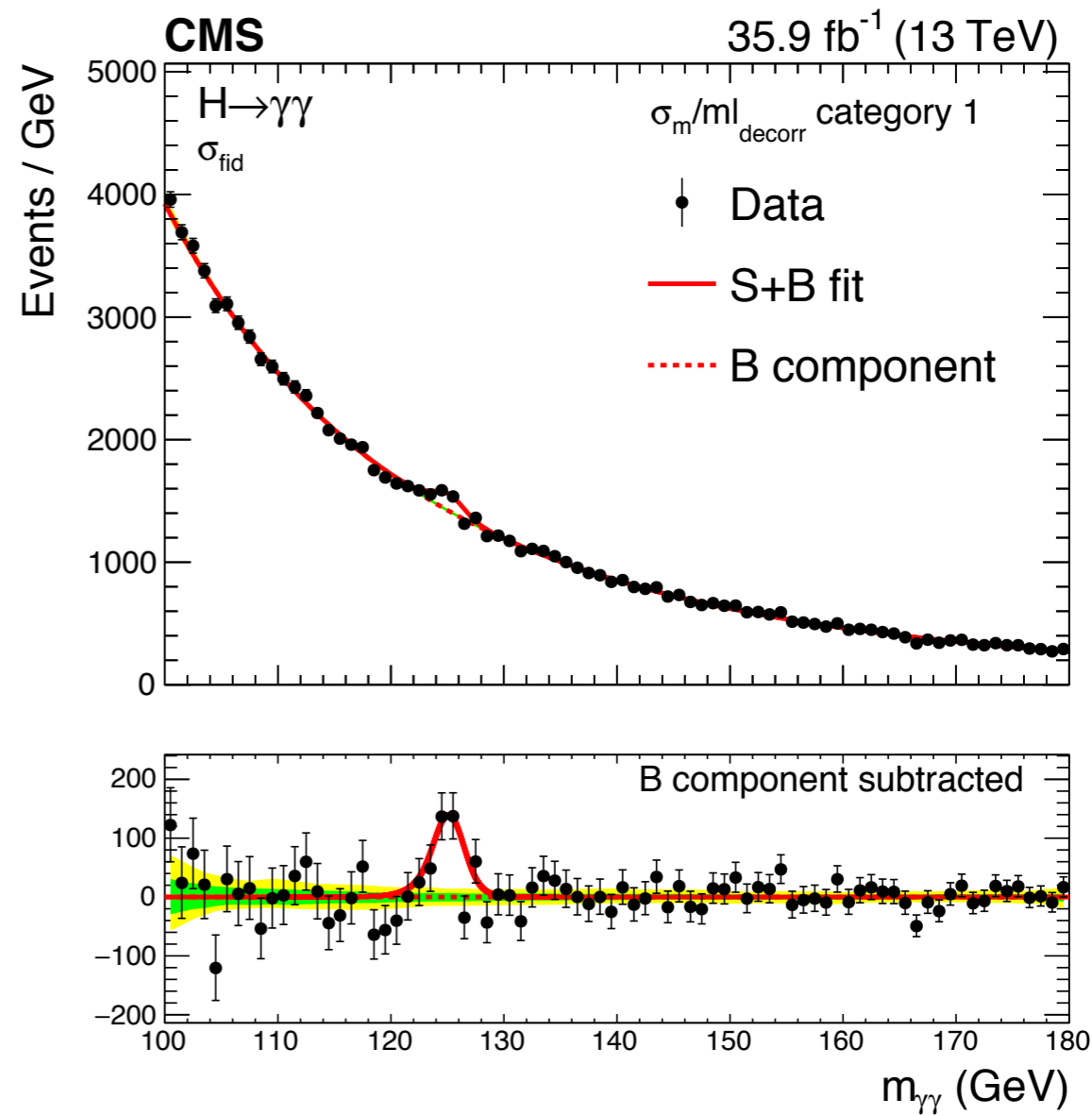
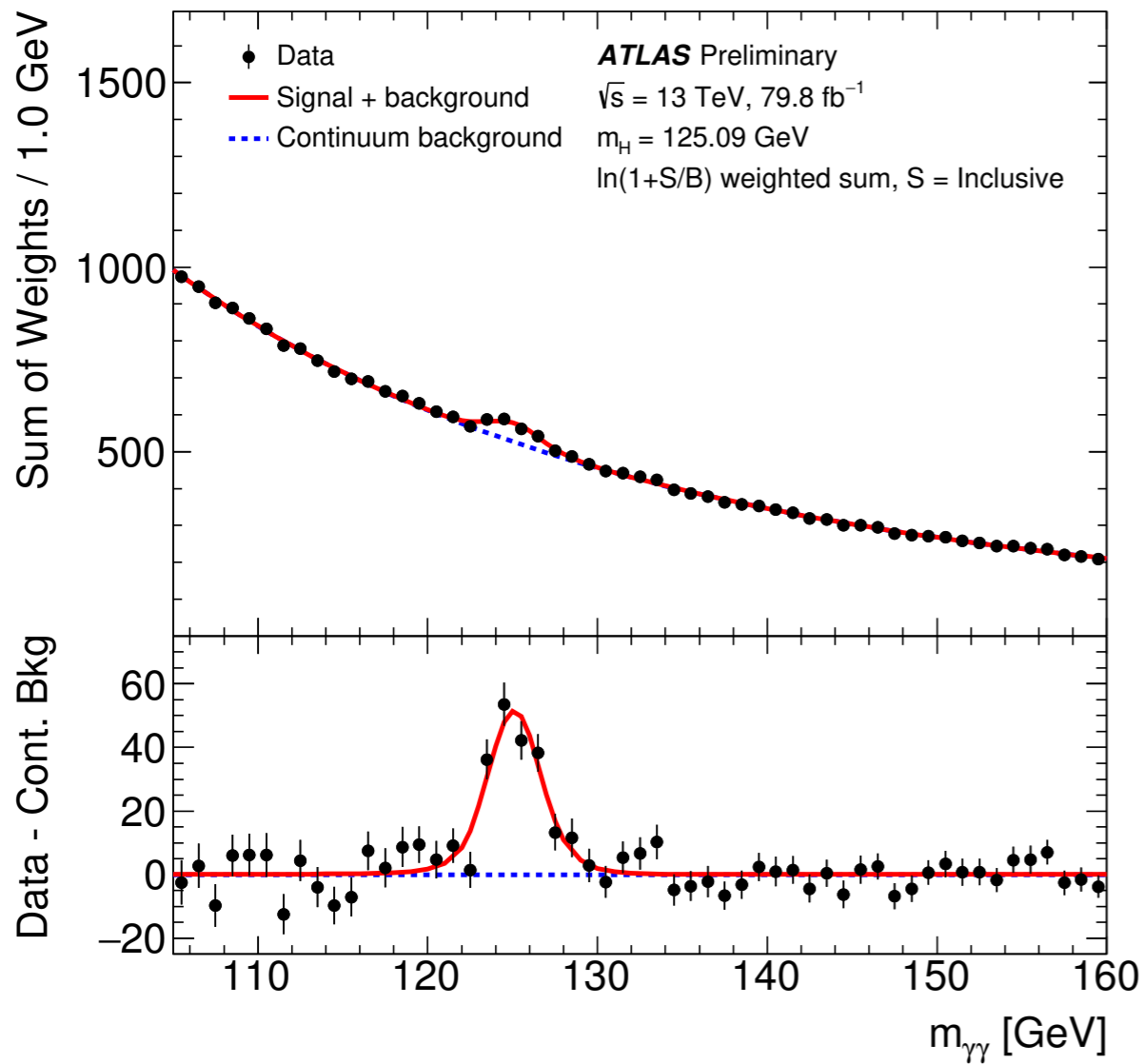


# Composite Higgs models

Da Liu

UC, Davis

With L.T. Wang and K.P. Xie



A first step towards the dynamics of EWSB!

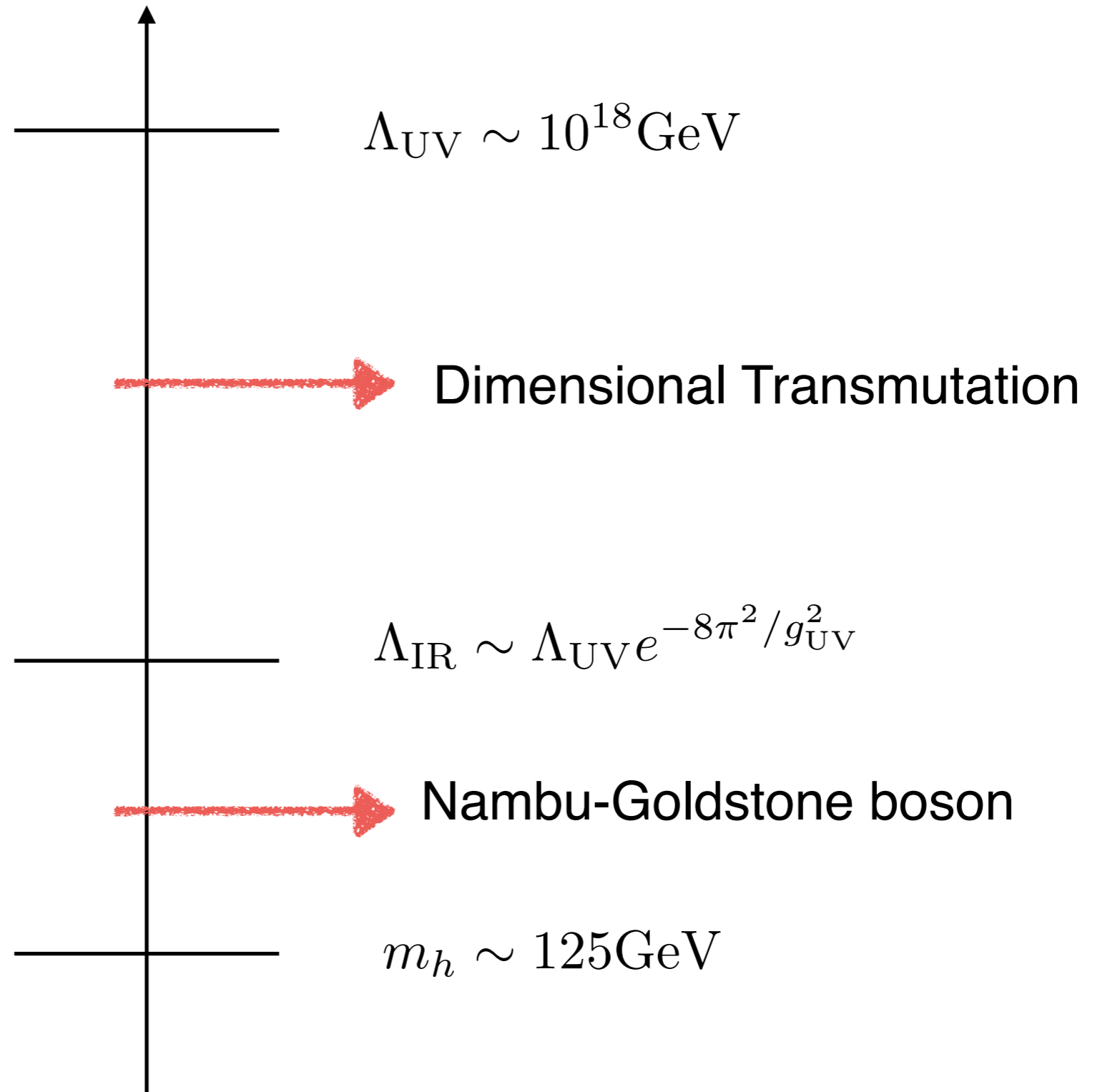
# t' Hooft Naturalness

A small parameter is natural  
if setting it to zero leads to an enhanced symmetry



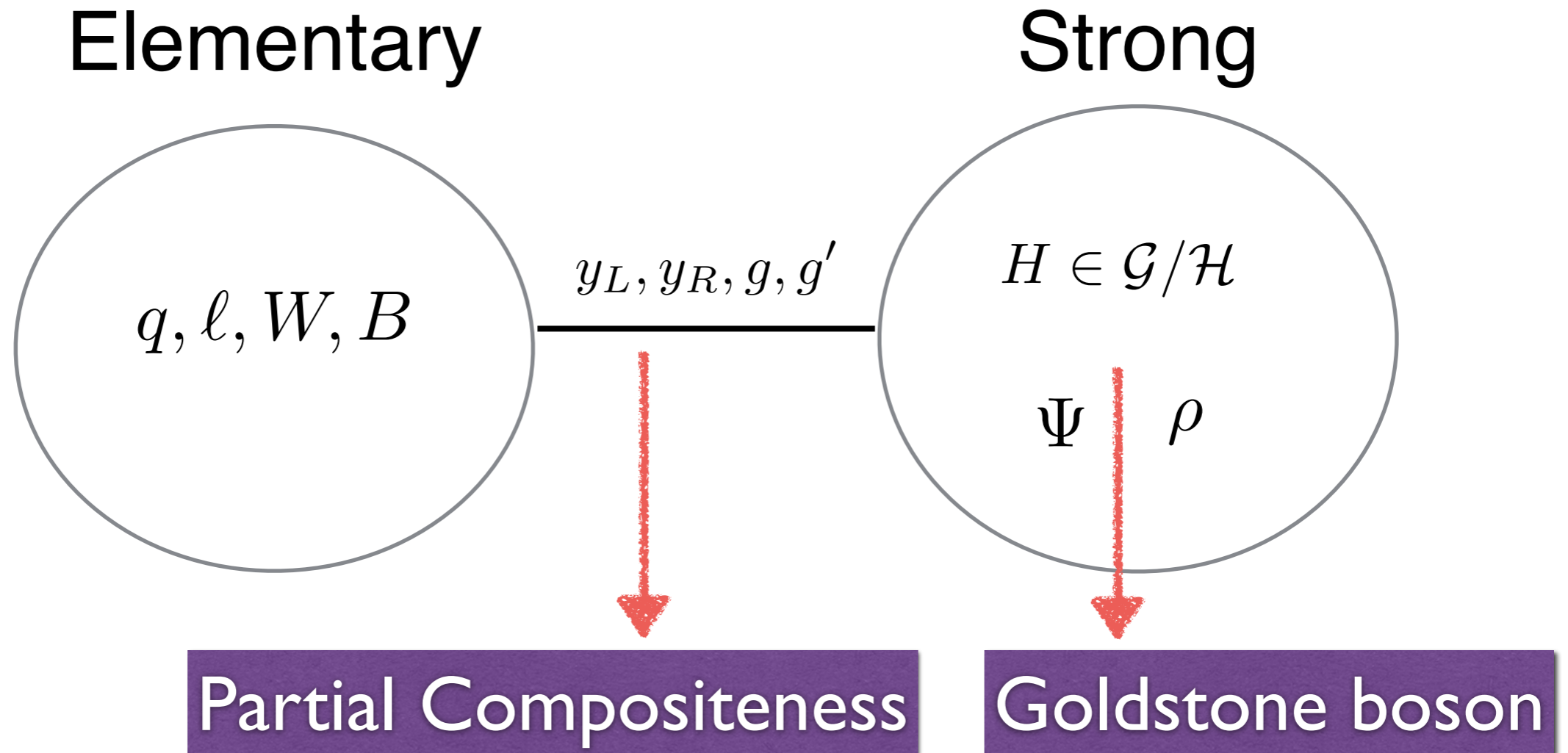
Higgs mass preserves all the SM symmetry

# Compositeness



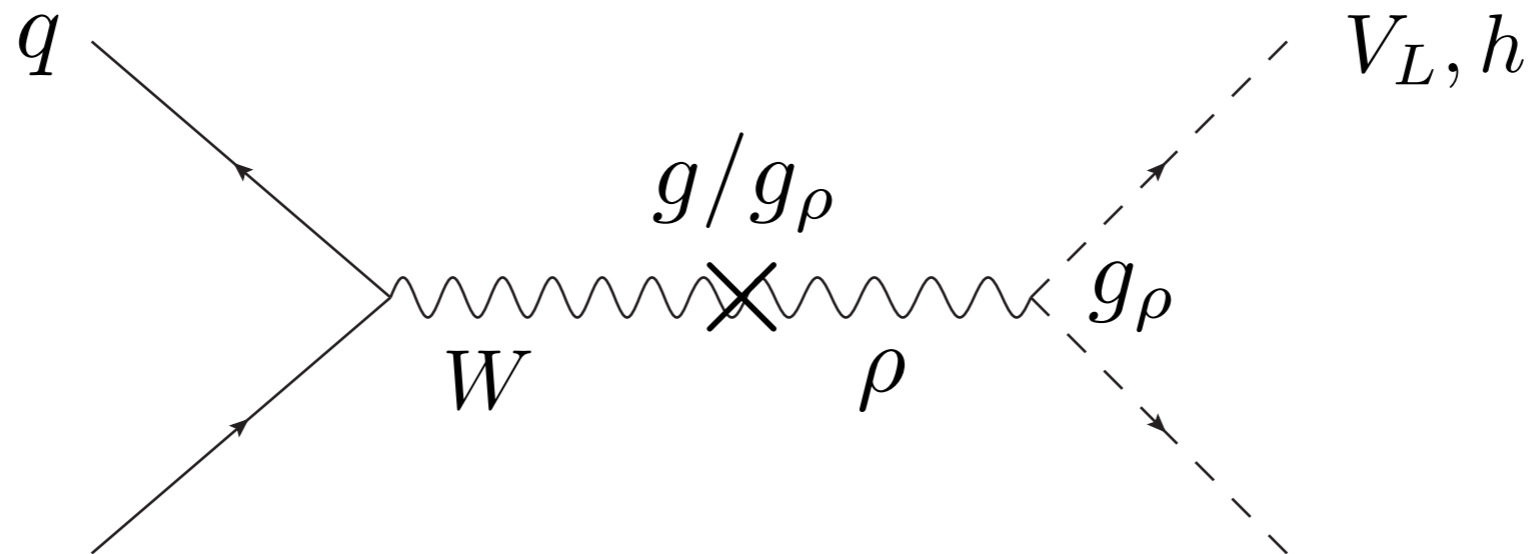
Enhanced shift symmetry!

# Composite Higgs models Sketch



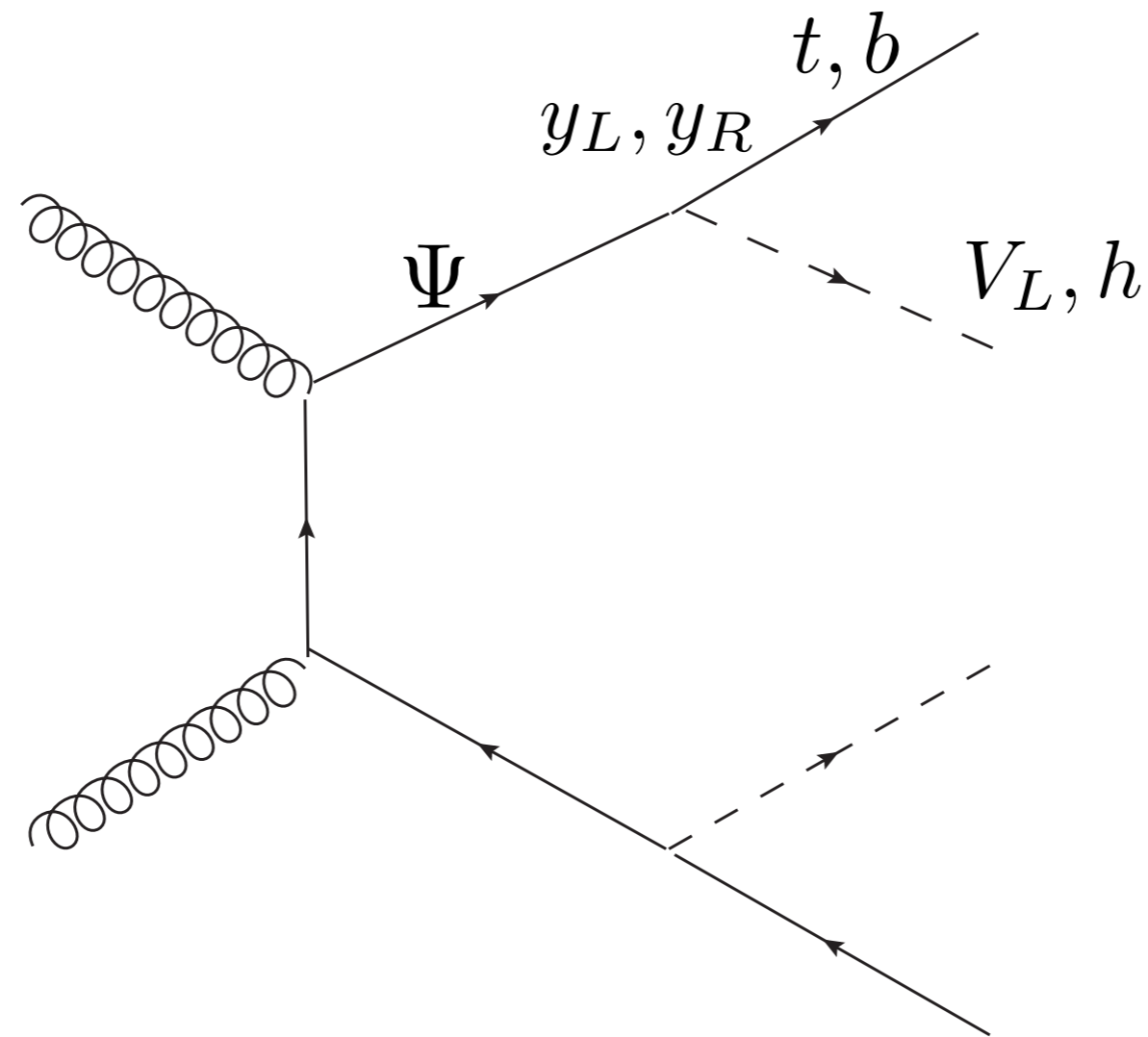
Kaplan, Georgi '84  
Contino, Nomura and Pomarol '03  
Agashe, Contino and Pomarol '04

# Direct searches: Spin-1



**Dibosons provide the smoking gun!**

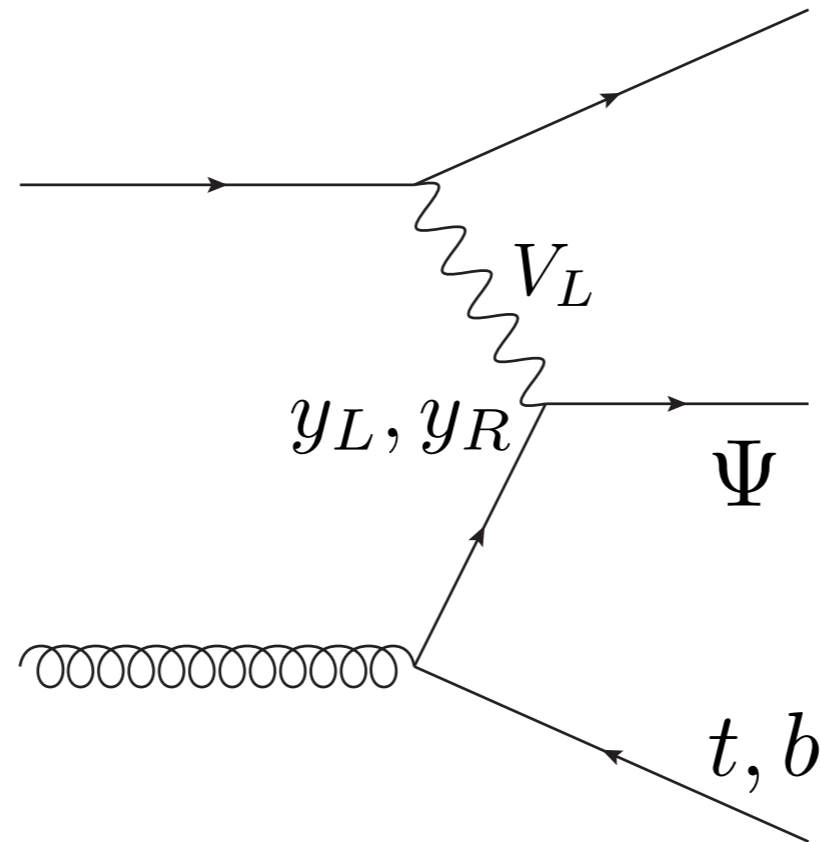
# Direct searches: spin-1/2



Top partners

$$\Psi \equiv X_{5/3}, T, B$$

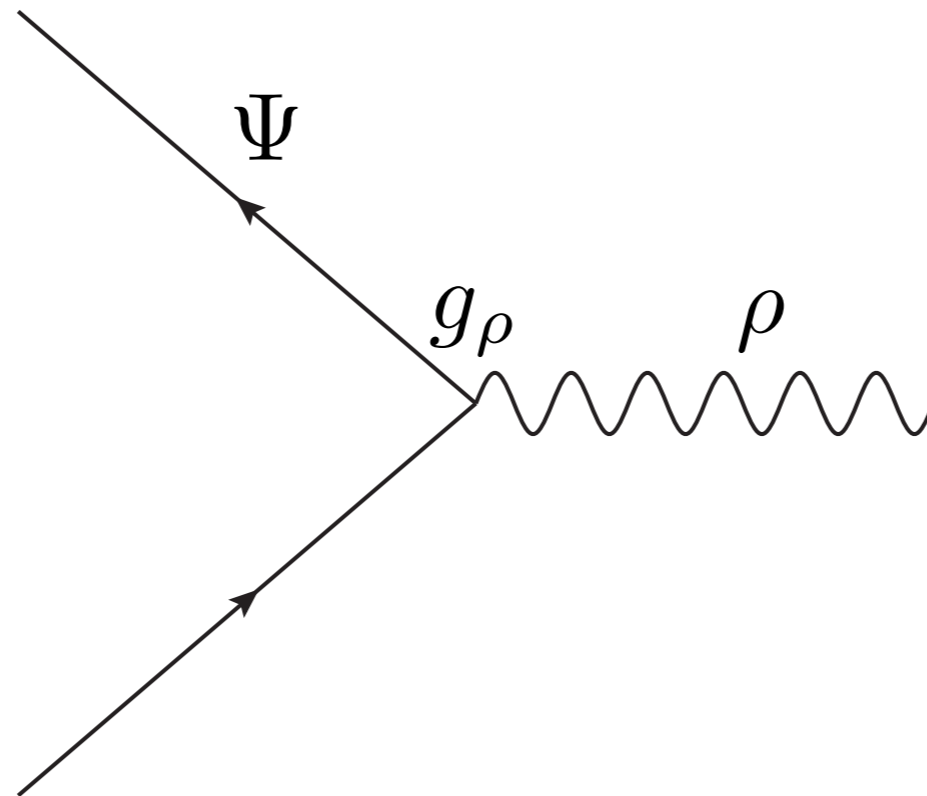
# Direct searches: Single production



Lower mass threshold!



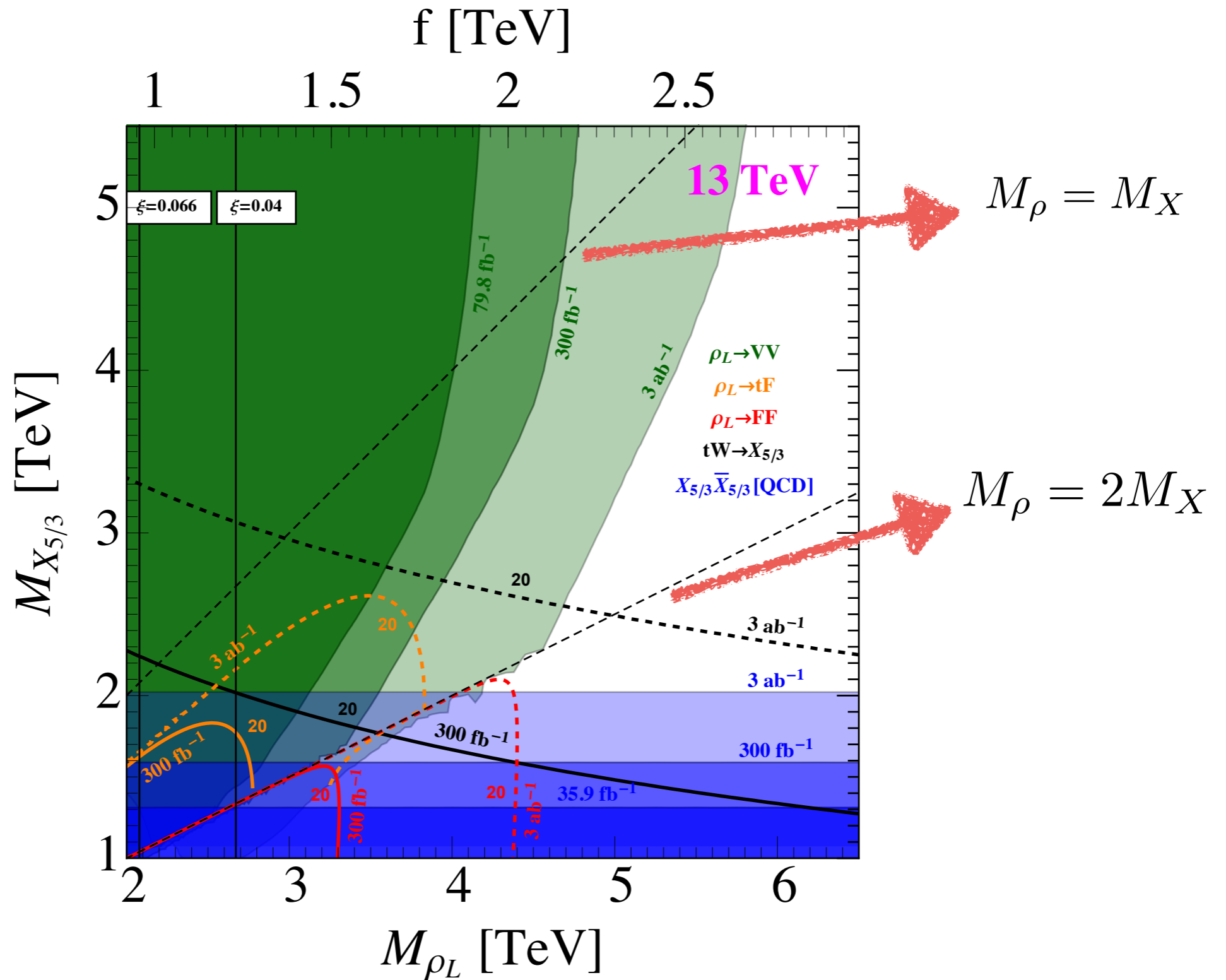
# Cascade decays



Have kinematical advantage!

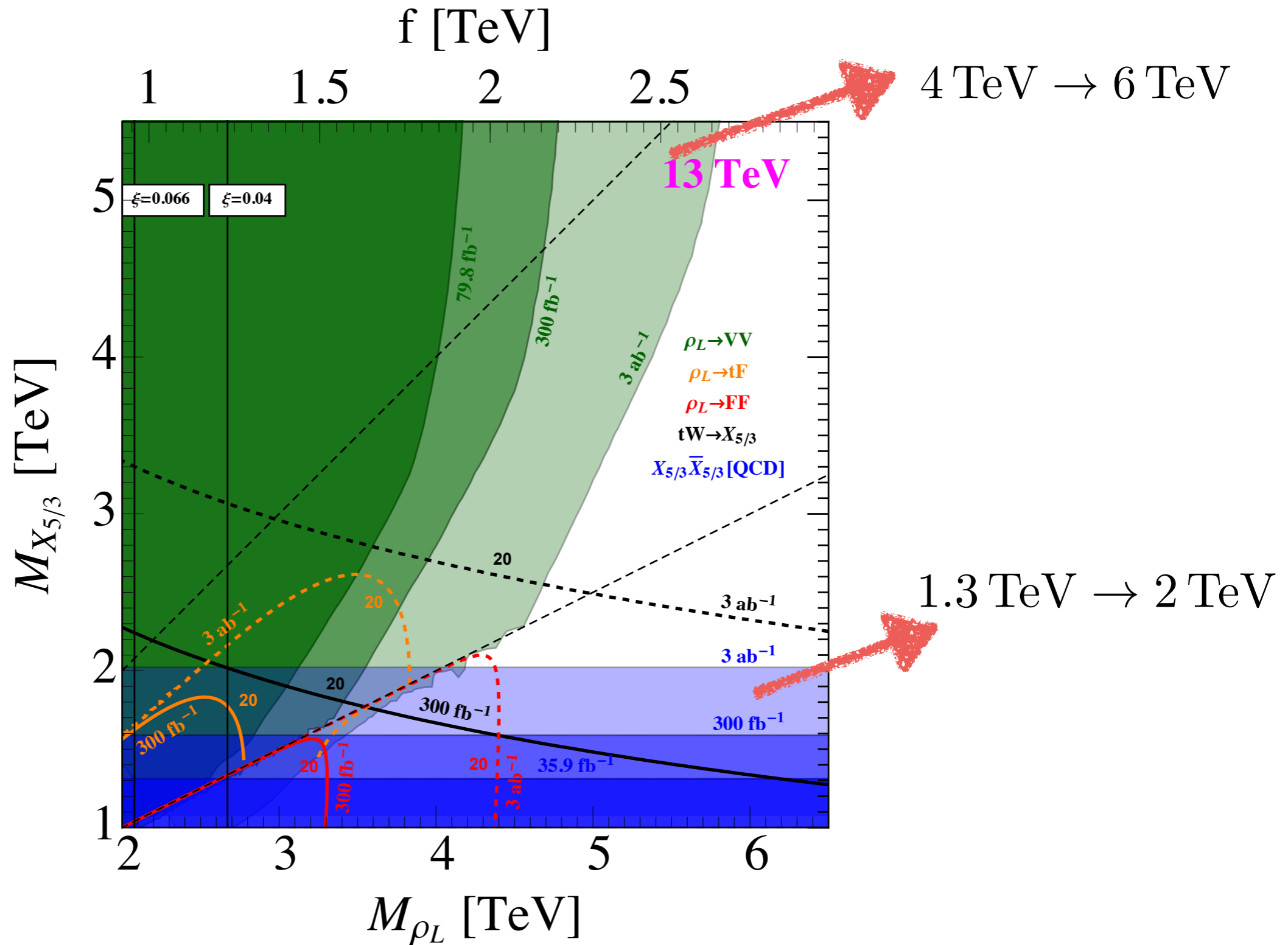
# Bounds and Projections

$$g_\rho = 3$$



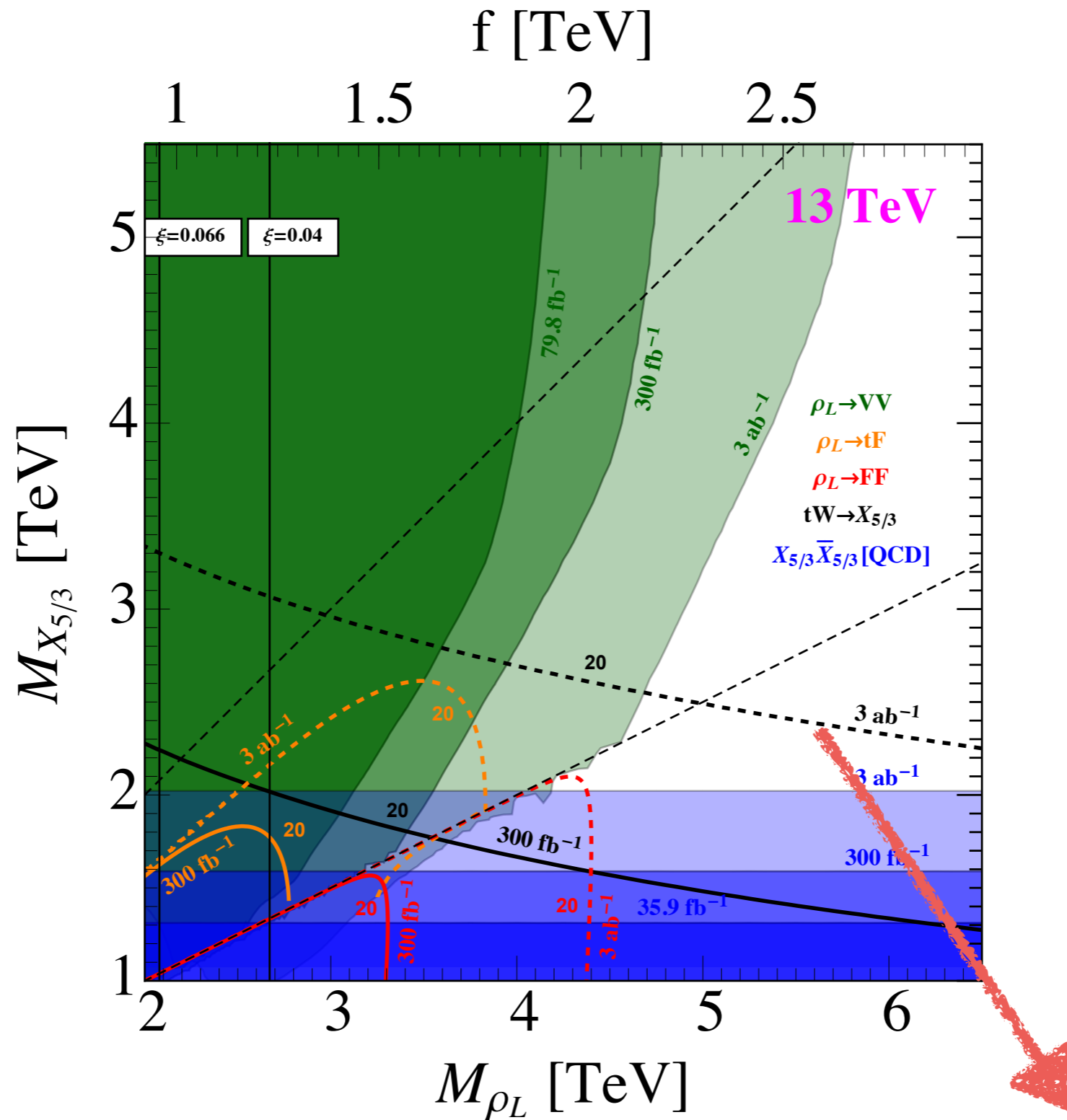
# Bounds and Projections

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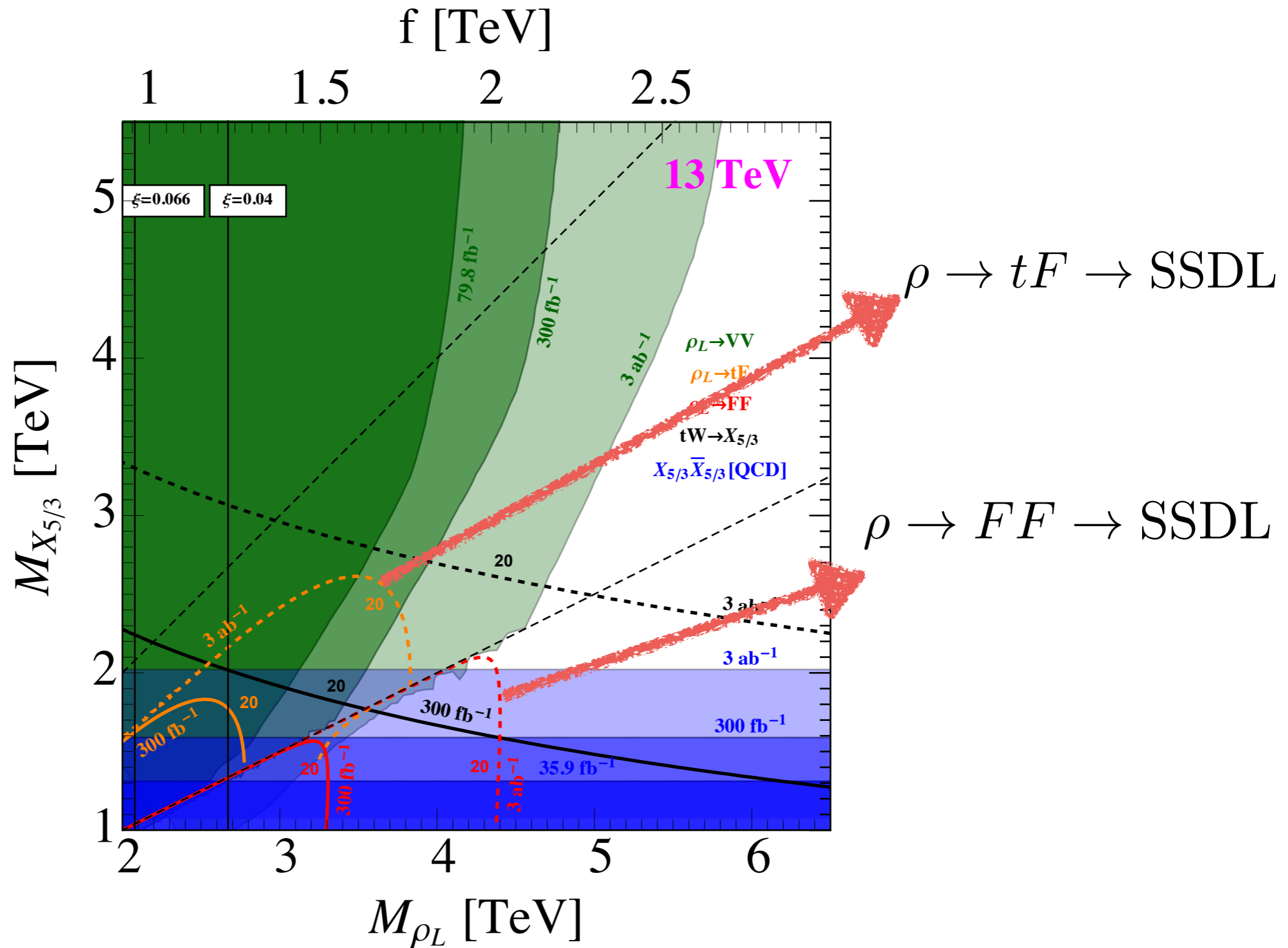


DL, L.T.Wang and K. P. Xie '18

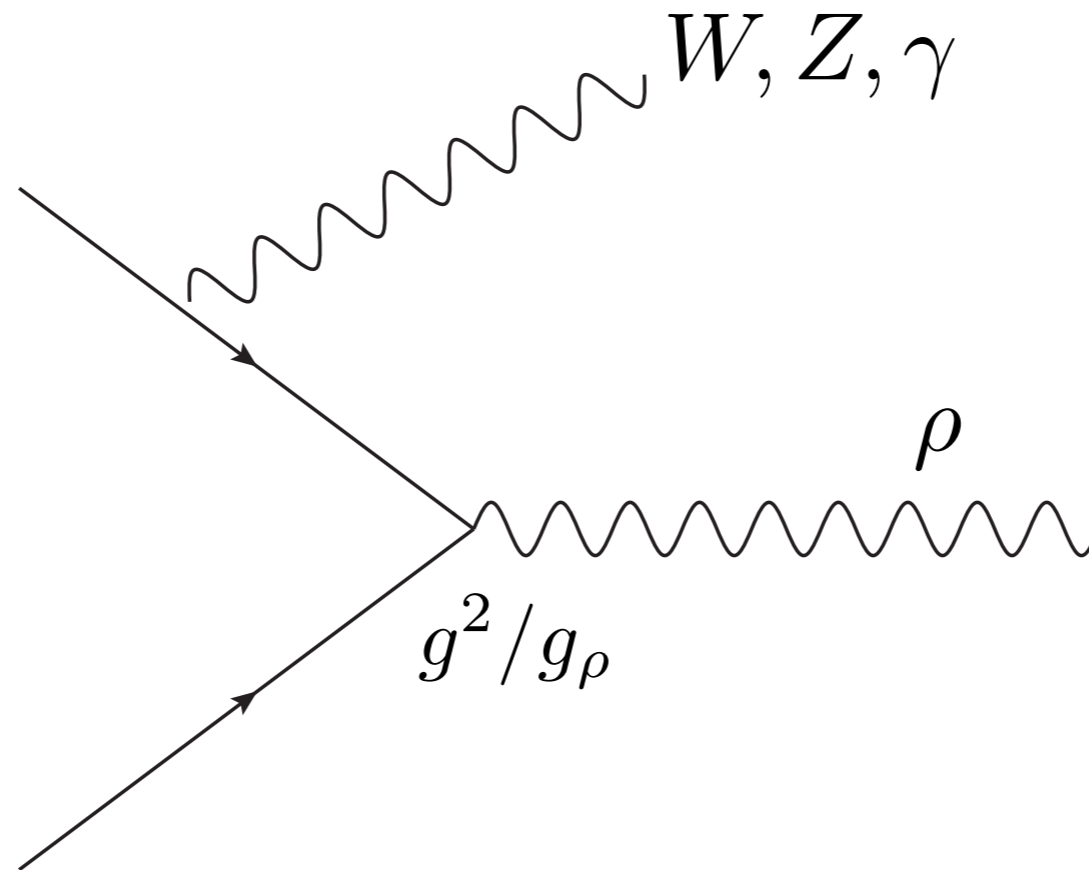
Single production eventually dominates

# Bounds and Projections

$$g_\rho = 3$$

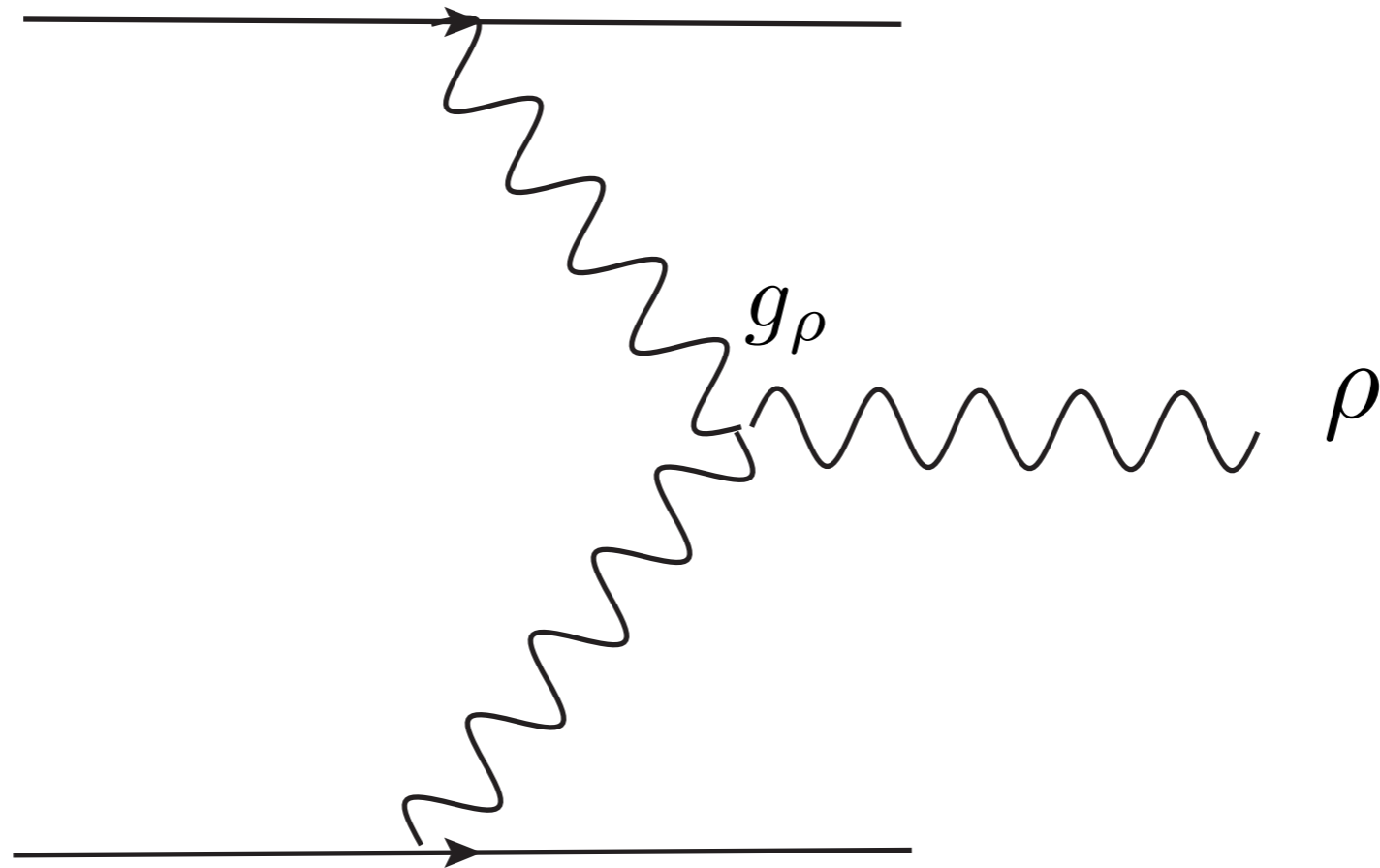


# Muon Collider

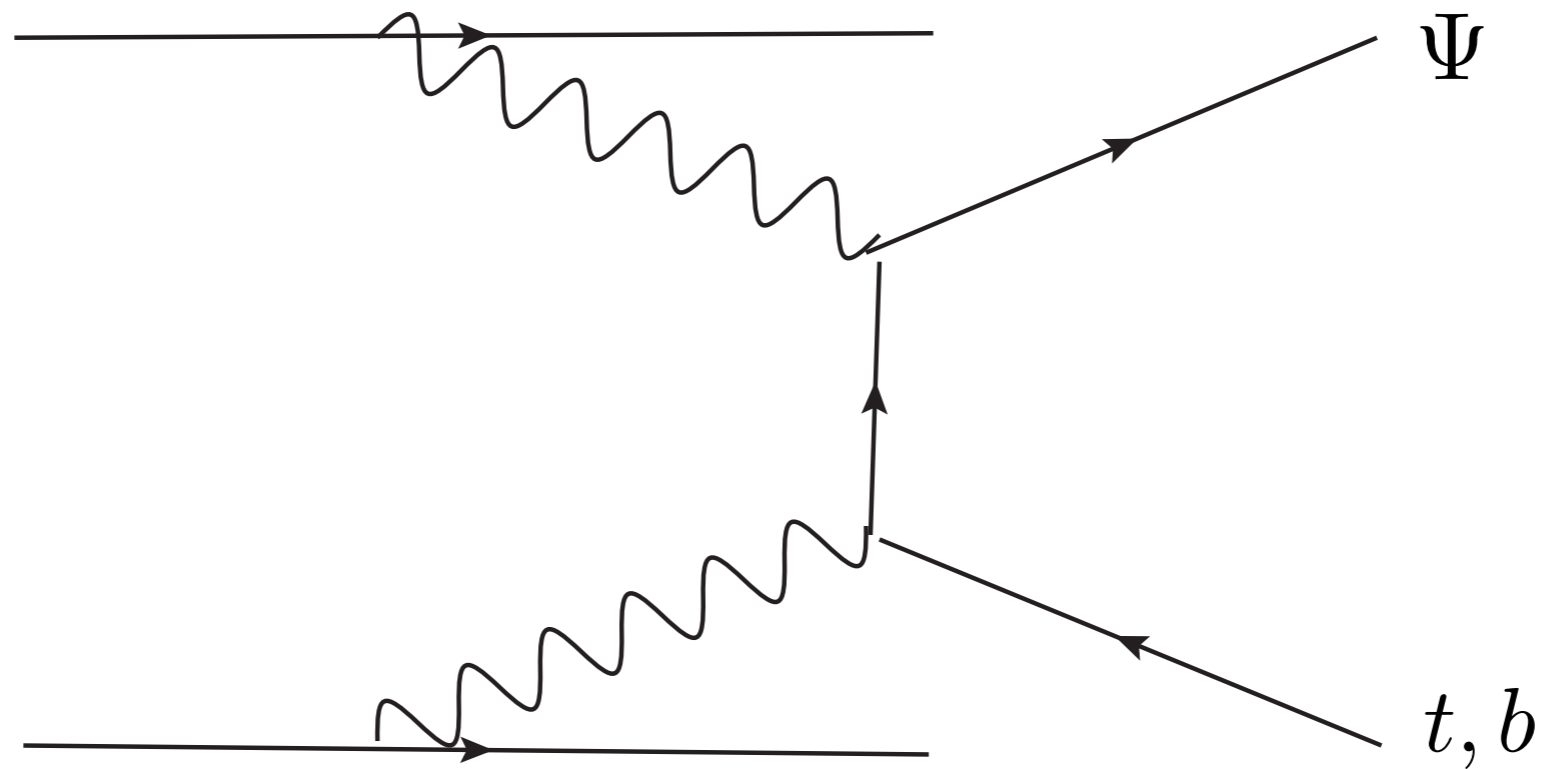


DL, L.T.Wang and K. P. Xie  
Working in progress

# Muon Collider



# Muon Collider



DL, L.T.Wang and K. P. Xie  
Working in progress



# Conclusion

- Compositeness is an elegant way to address the hierarchy problem.
- Prospects at high energy muon collider are under careful scrutiny