

# *Luca Mantani*

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VNIVERSITAT  
ID VALÈNCIA



# My journey

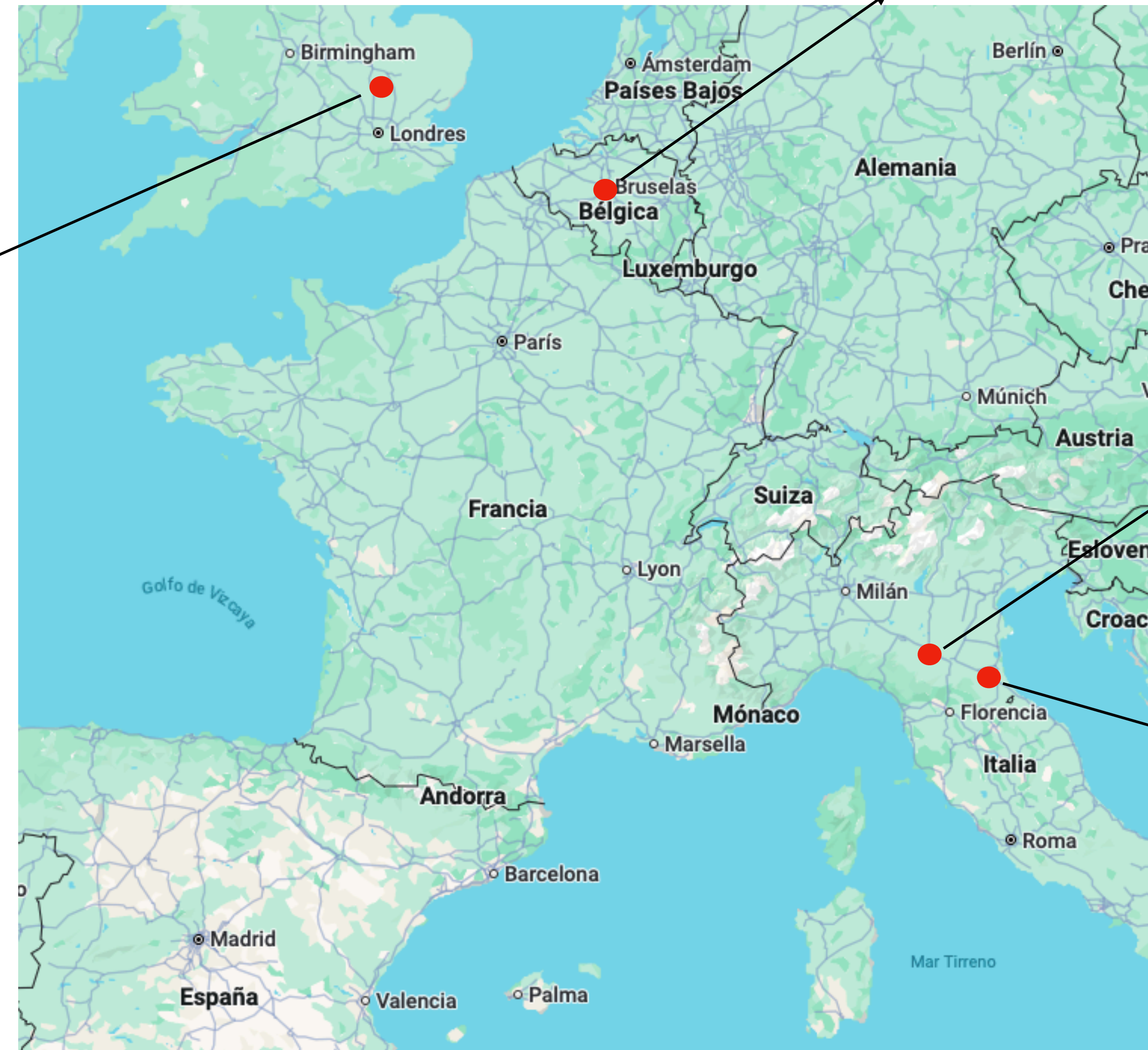
Brussels



Bologna



Longiano

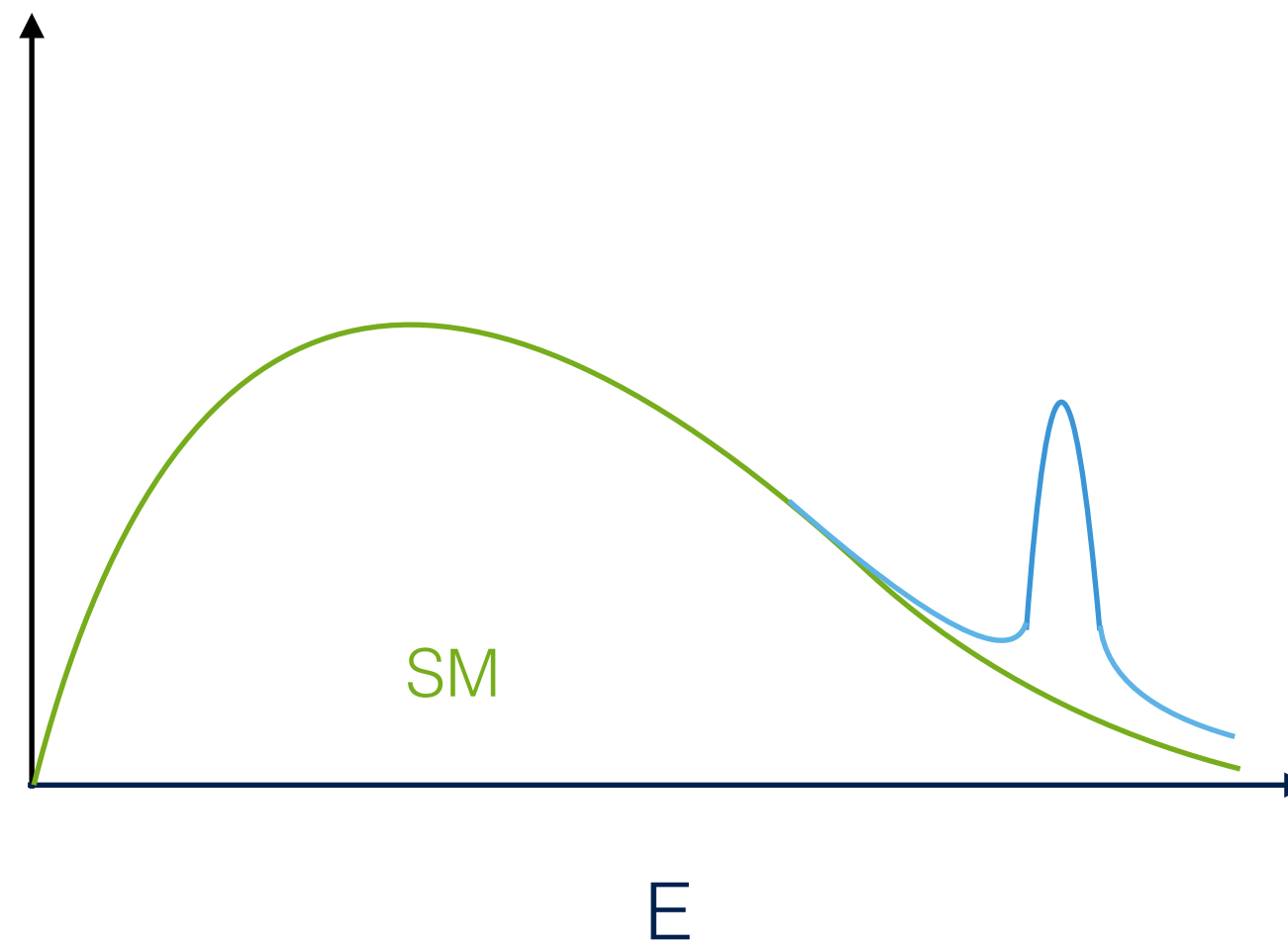


Cambridge



# The quest for New Physics

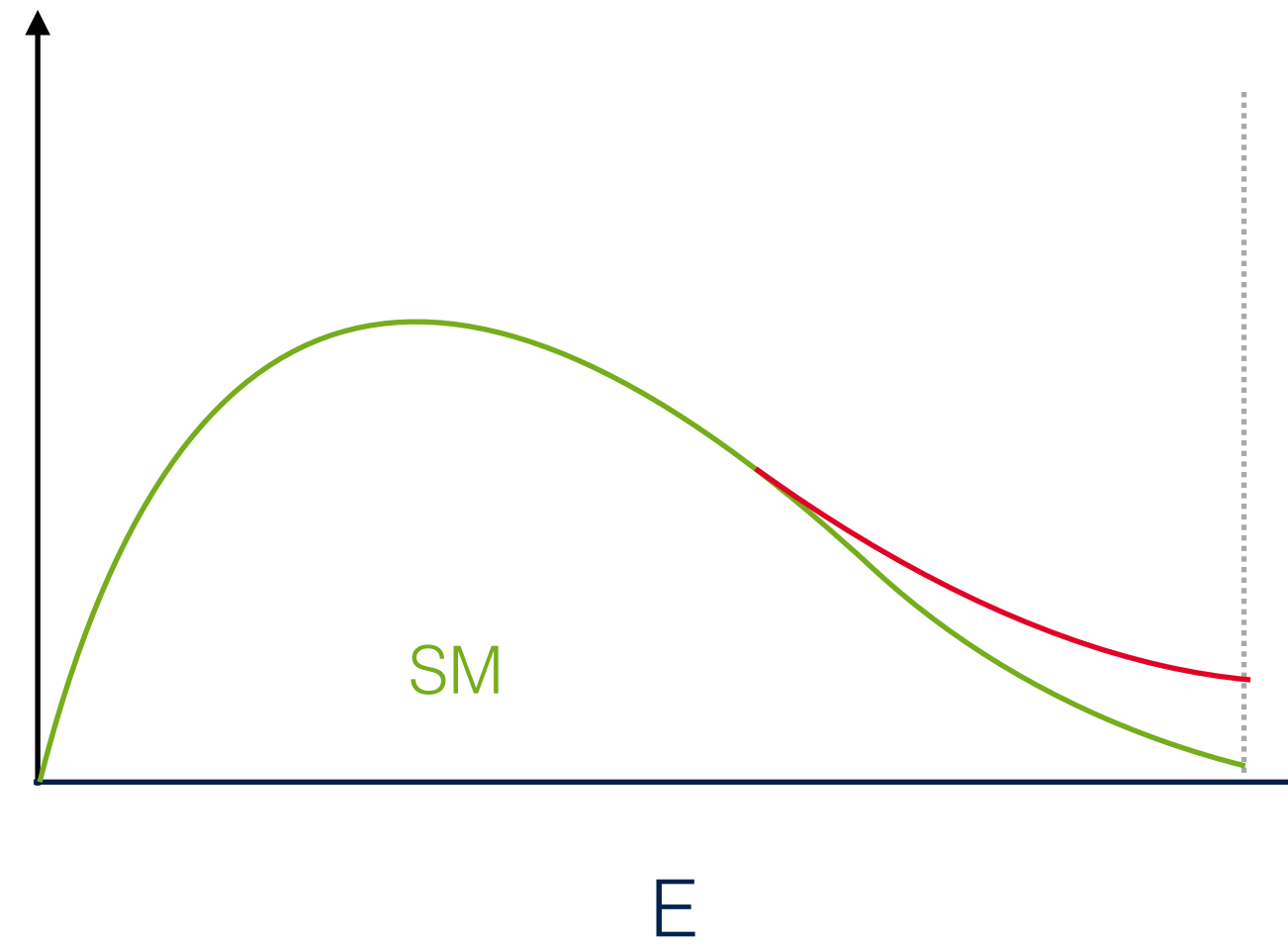
Direct search (Bumps)



# The quest for New Physics

Direct search (Bumps)

Indirect (scouting tails)

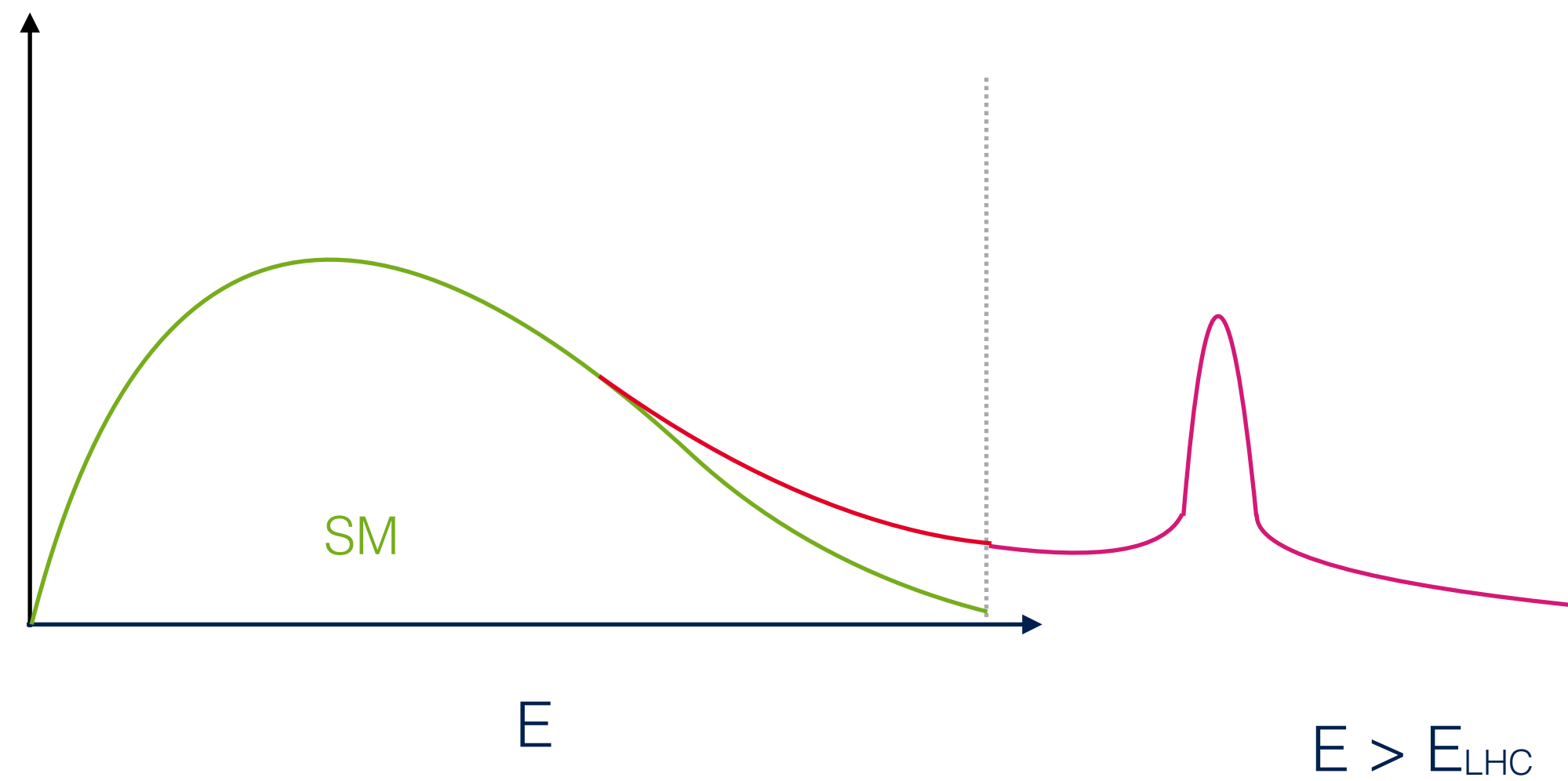


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New physics is heavy

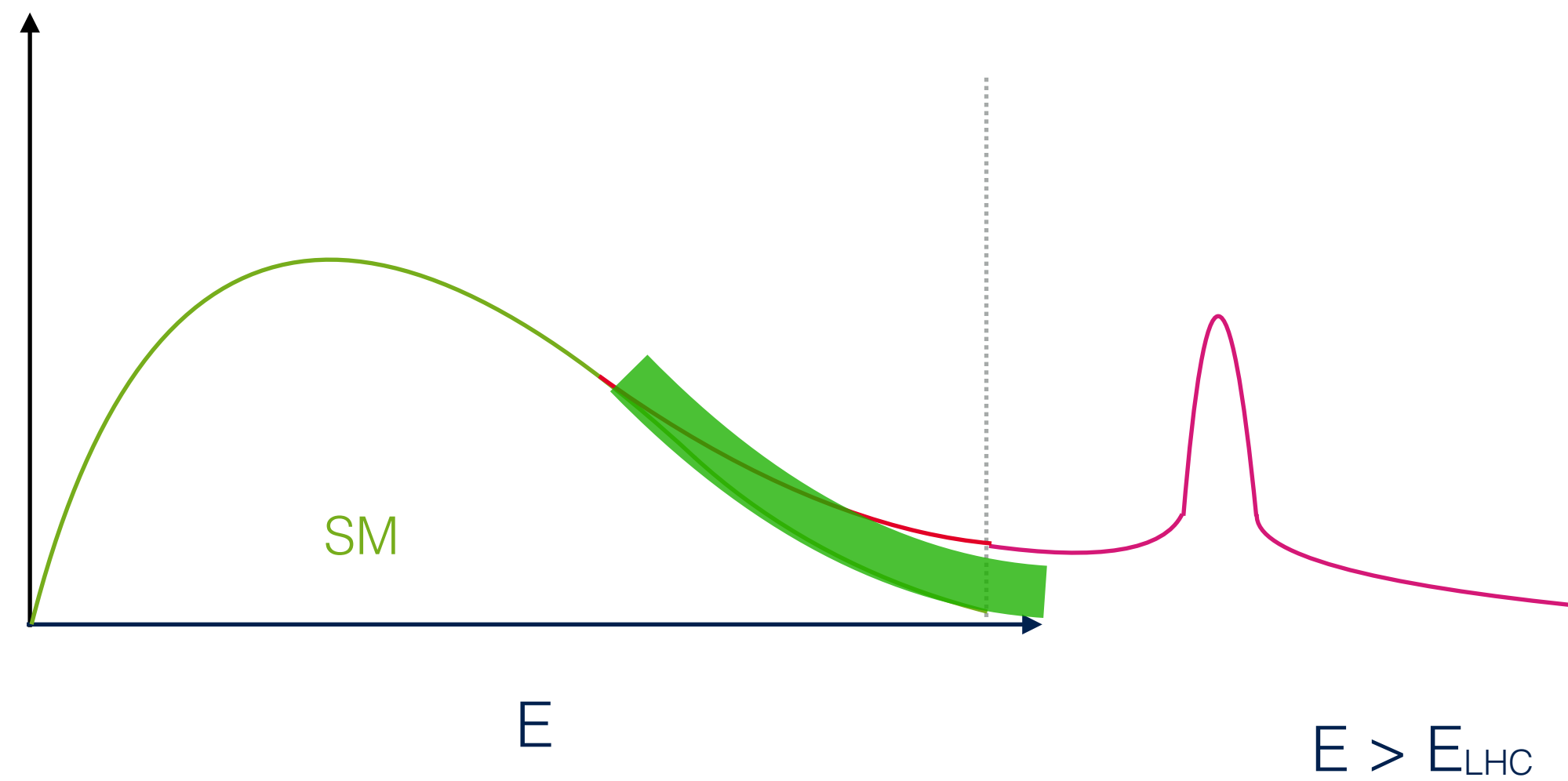


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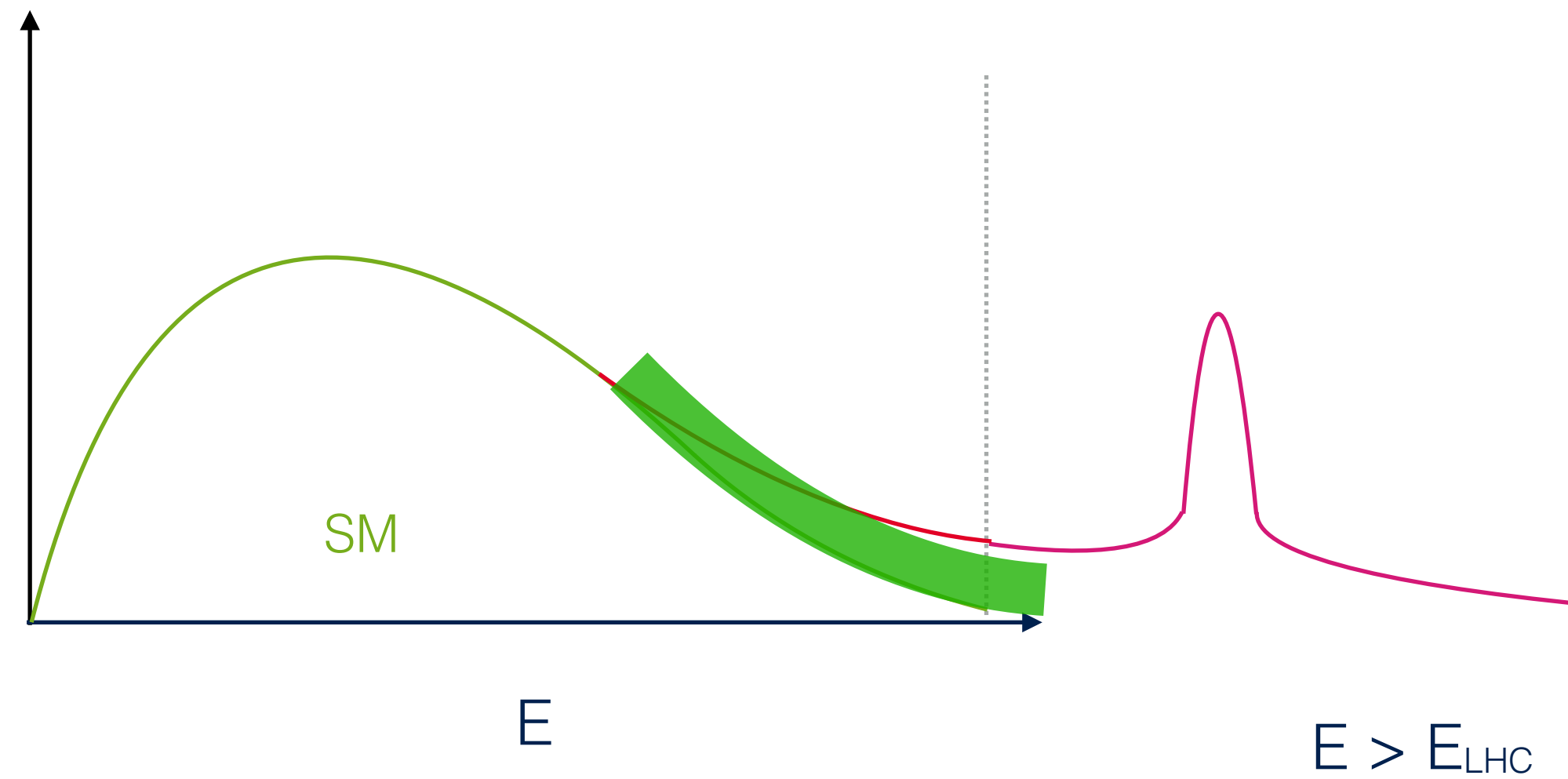


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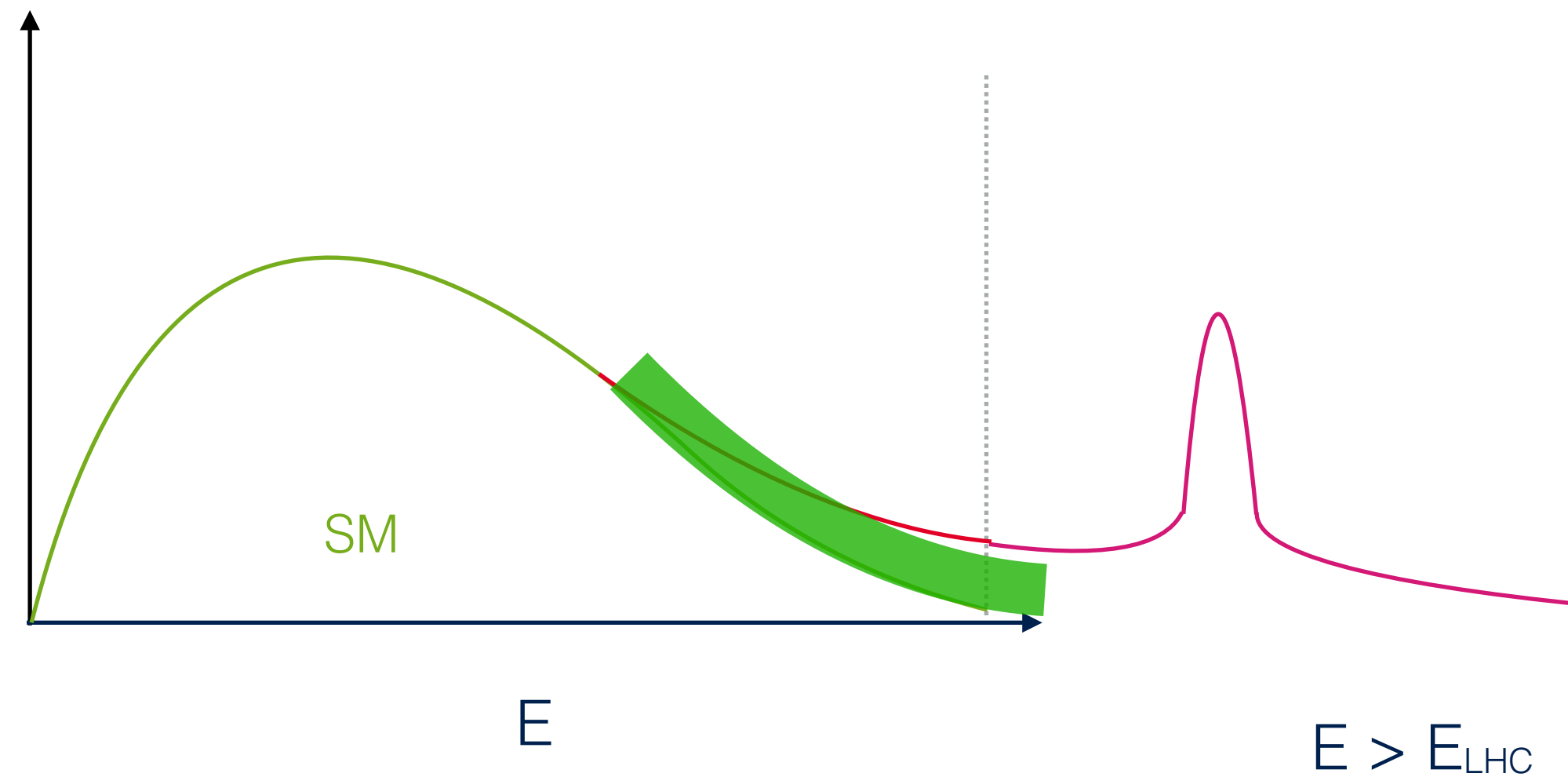
Framework to describe both precision physics and Heavy New Physics

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Framework to describe both precision physics and Heavy New Physics

**Standard Model Effective Field Theory (SMEFT)**

# The SMEFT

$$\mathcal{L} = \mathcal{L}_{SM} + \sum_i \frac{1}{\Lambda} \mathcal{O}_i^5 + \sum_i \frac{1}{\Lambda^2} \mathcal{O}_i^6 + \dots$$

Scale of NP

- \* Modified interactions among SM particles
- \* Higher dimensional operators preserve SM symmetries.
- \* Mappable to a large class of BSM models.
- \* Truncate at dim 6: leading corrections

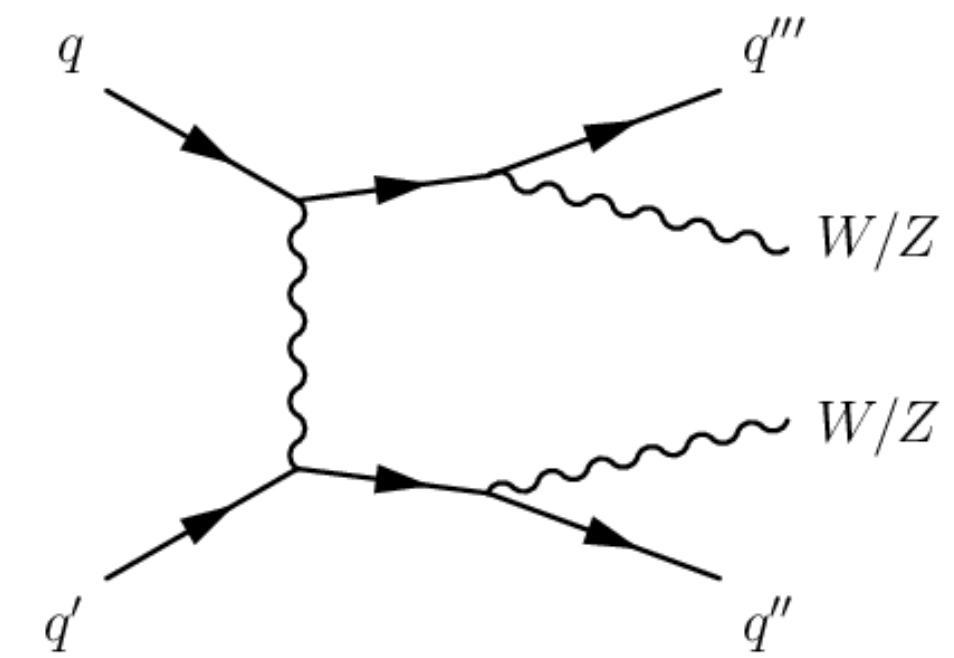
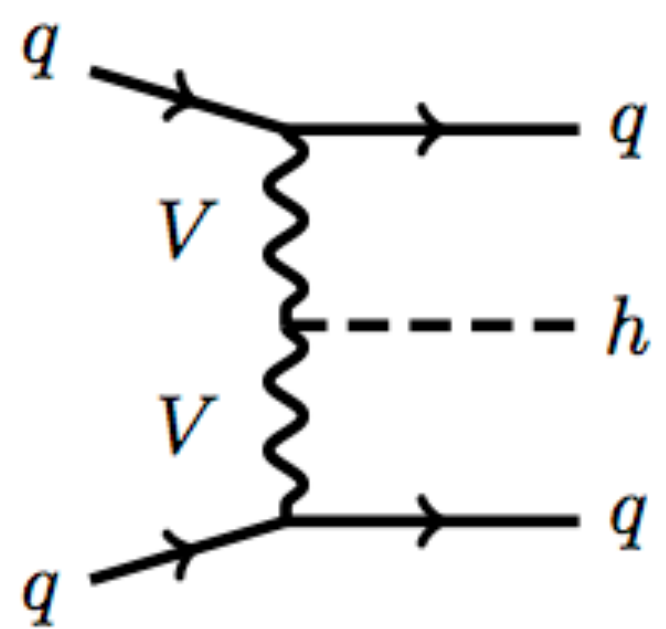
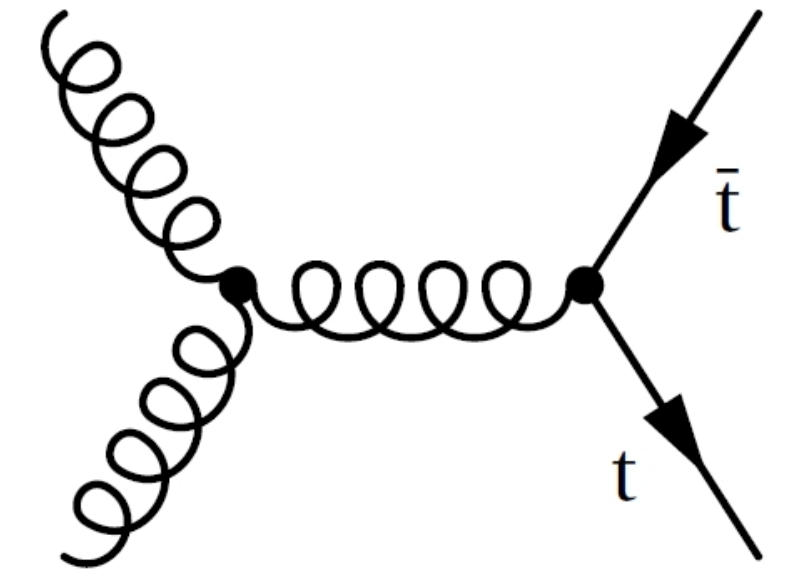
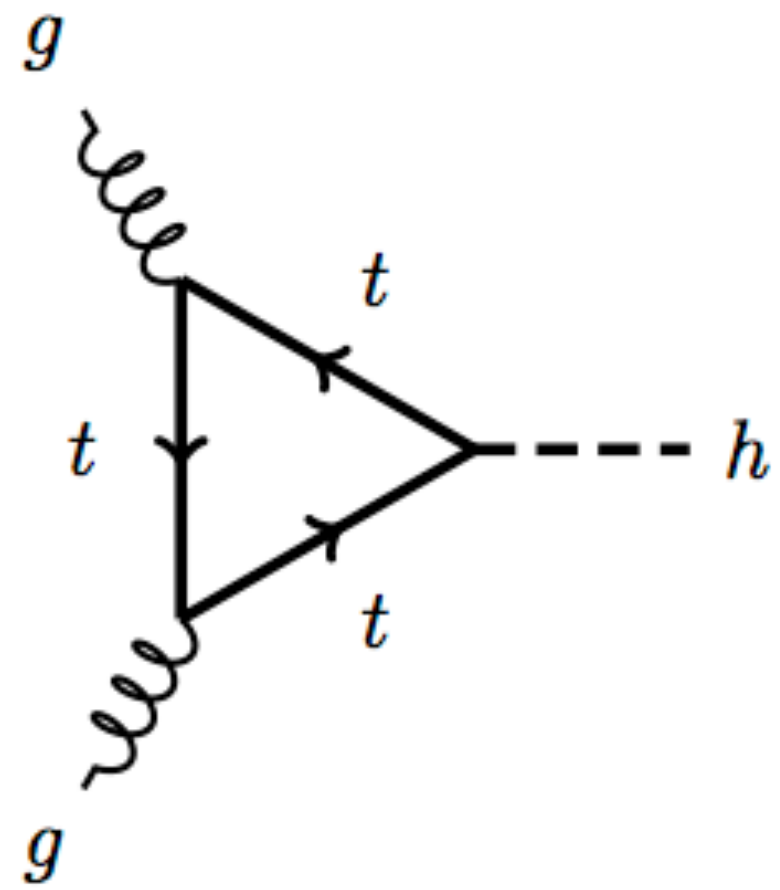
## EFT to-do list

- \* Define target operators: e.g. top-philic EFT
- \* Find optimal observables to probe them
- \* Compute with precision theoretical predictions (both SM and EFT)
- \* Make accurate measurements

# My research focus

The LHC is producing hundreds of measurements from particle collisions

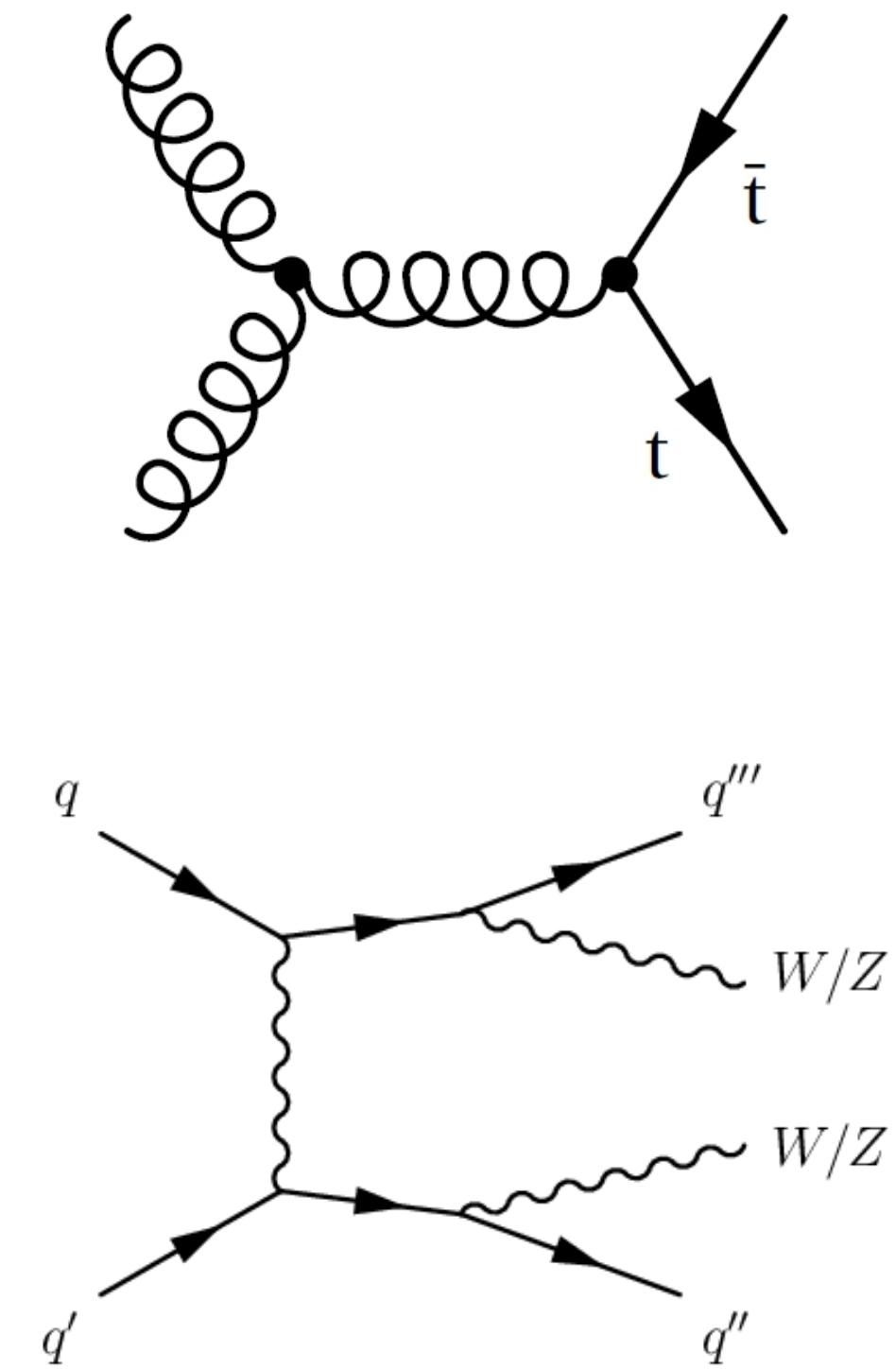
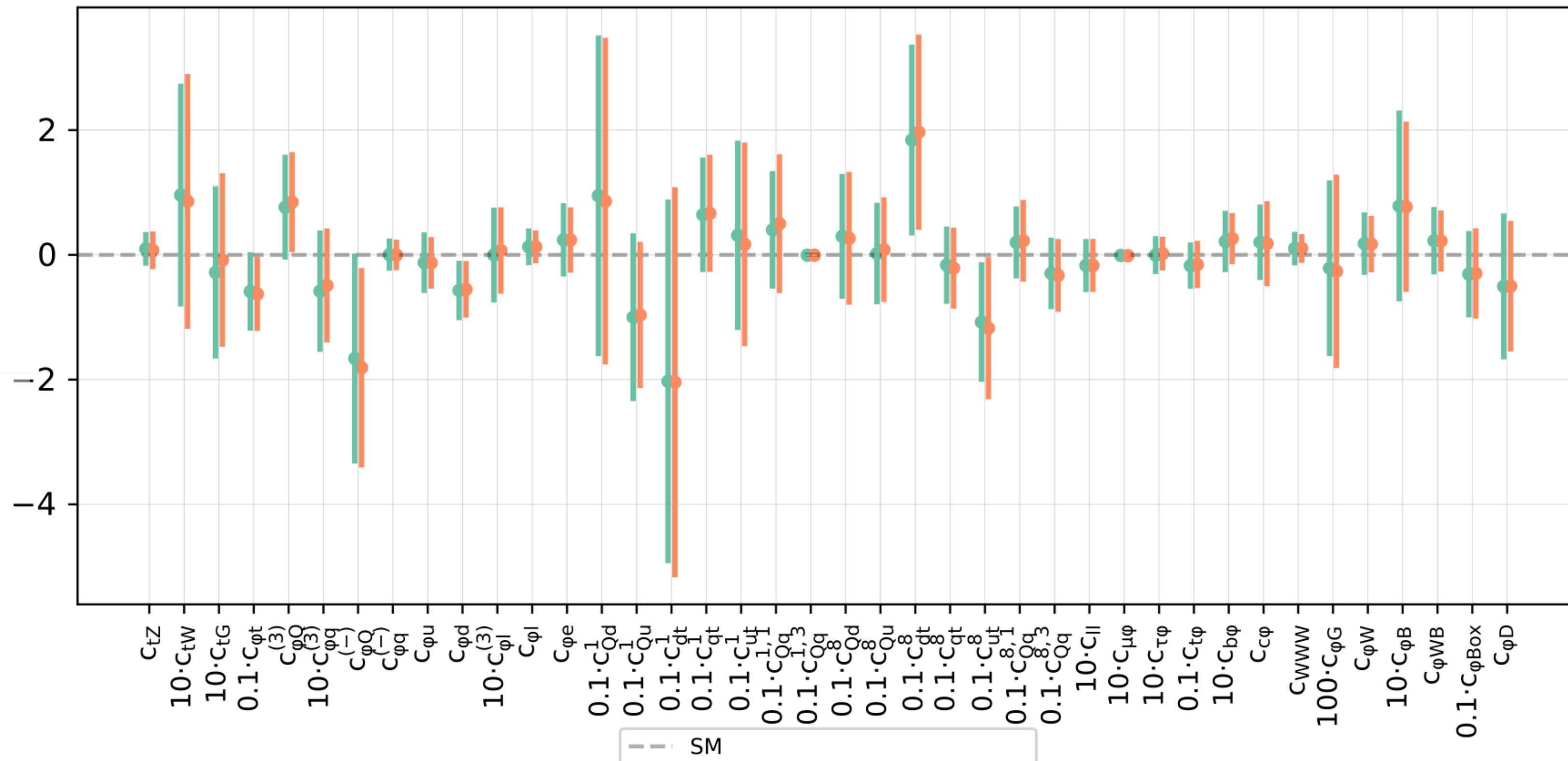
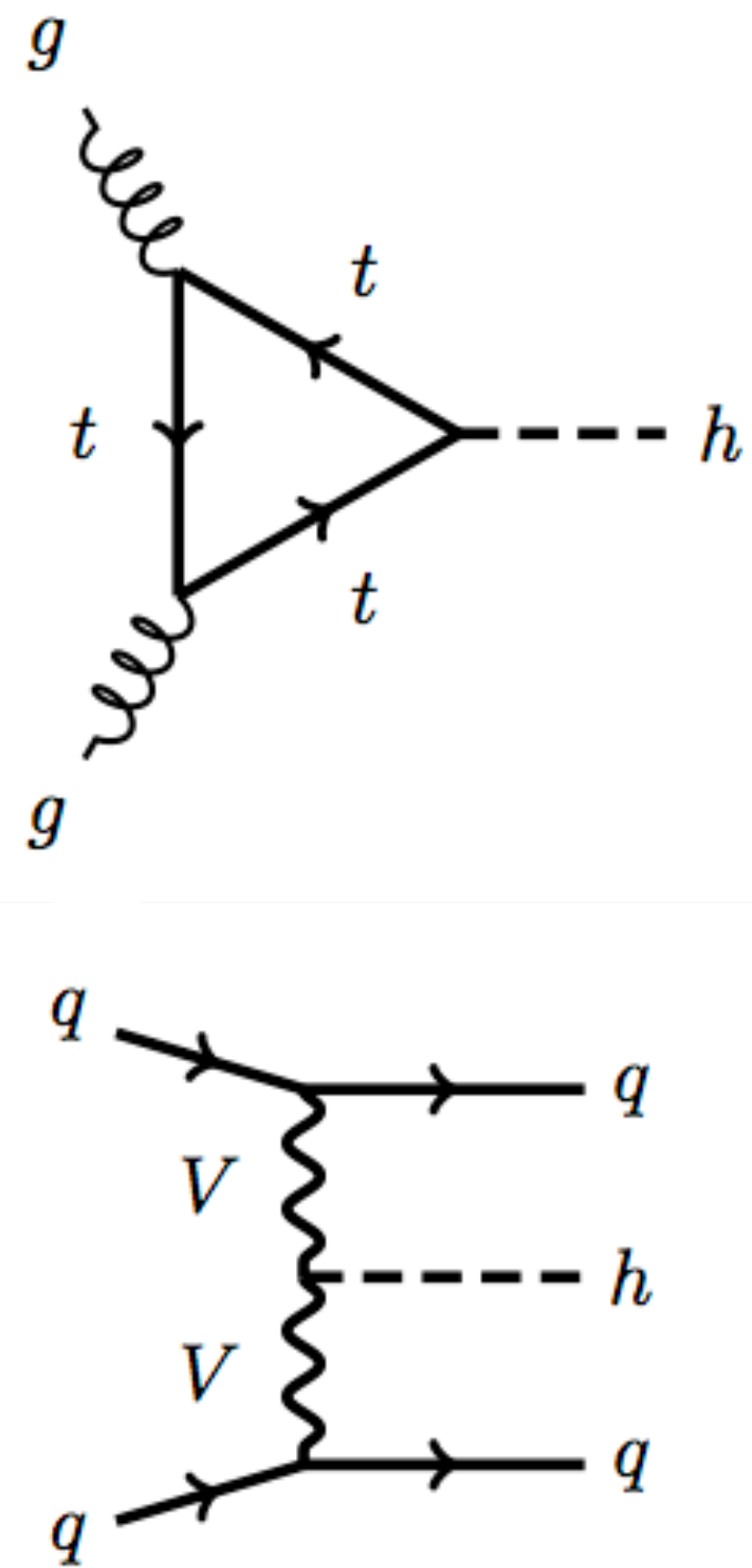
**Idea:** we put them all together,  
in a vast search for new interactions




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*Thank you*

