

# Razor Analysis: Trigger Efficiency Estimation

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# Razor variables

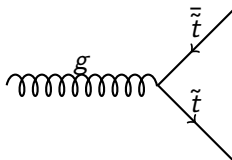
- $M_R$  and  $R^2$ : Kinematic variables related to MET
- Allow for detection of massive, non-detectable final state particles

# Razor variables

- $M_R$  and  $R^2$ : Kinematic variables related to MET
- Allow for detection of massive, non-detectable final state particles
- SUSY!
- Mass range: between few hundred GeV and few TeV

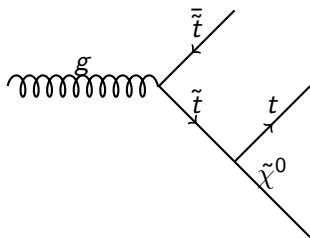
# Decay process

- Gluon produces stop pair



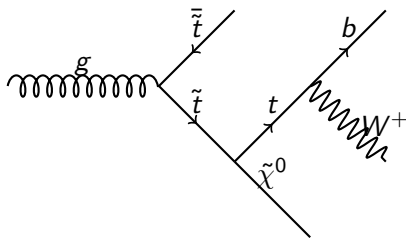
# Decay process

- Gluon produces stop pair
- $\tilde{t} \rightarrow \tilde{\chi}^0 t$



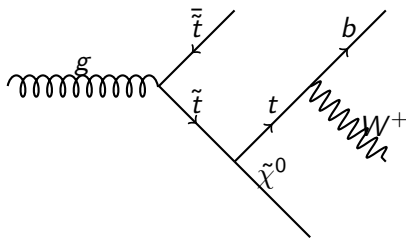
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# Decay process

- Gluon produces stop pair
- $\tilde{t} \rightarrow \tilde{\chi}^0 t$
- $t \rightarrow W^+ b$ 
  - Looking for  $2 \times 2$  jets with large MET



# Problem

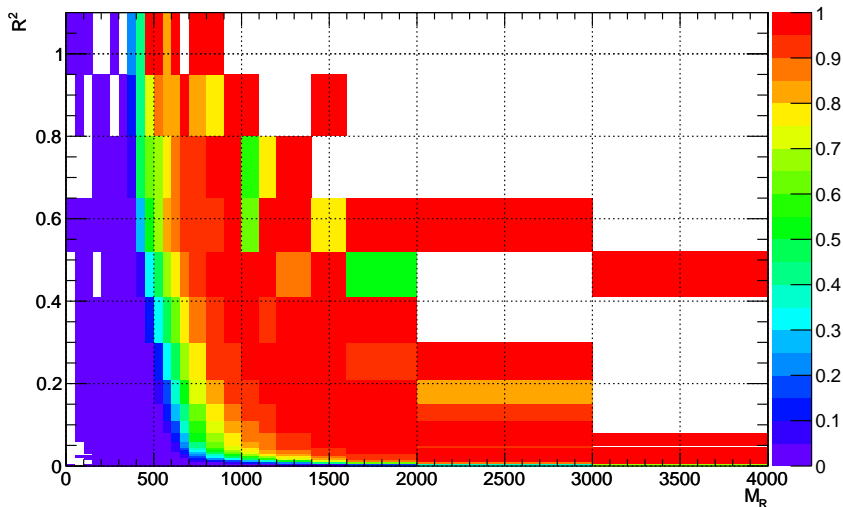
- Working with razor variables:  $(M_R, R^2)$ -plane
- Efficiency of online triggers is unknown
- But it must be taken into account when making our data-driven background fit!



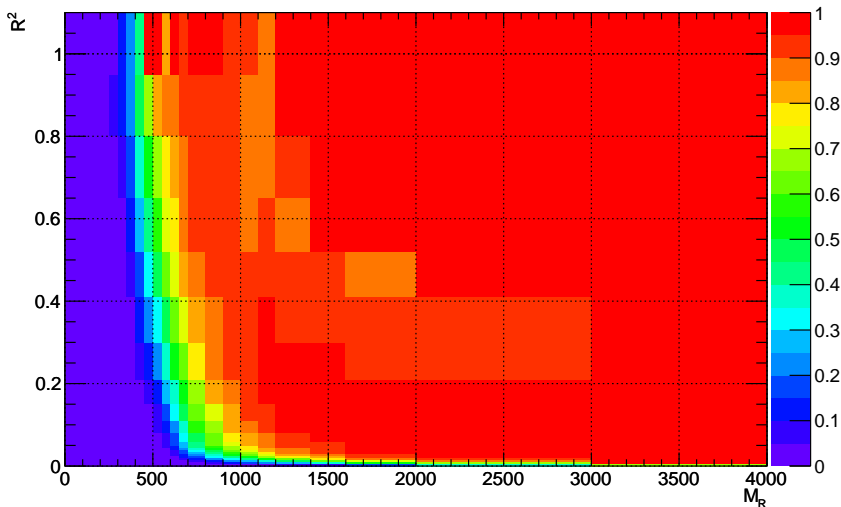
# Solution

- Take data from triggers that are uncorrelated to the ones used for the fit
- Calculate what fraction of events in would pass the actual triggers
- Multiply eventual fit with that fraction

# Trigger efficiency



# Smoothed and extrapolated trigger efficiency



# Finally...

- Multiply the background fit with these efficiency bins
- Final piece of the background puzzle!
- Next few weeks:
  - Finalising the background fits...

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- Multiply the background fit with these efficiency bins
- Final piece of the background puzzle!
- Next few weeks:
  - Finalising the background fits...
  - Looking for any excess over this background...
  - Finding SUSY! (or setting limits...)

Thank you for your attention!  
Questions...?