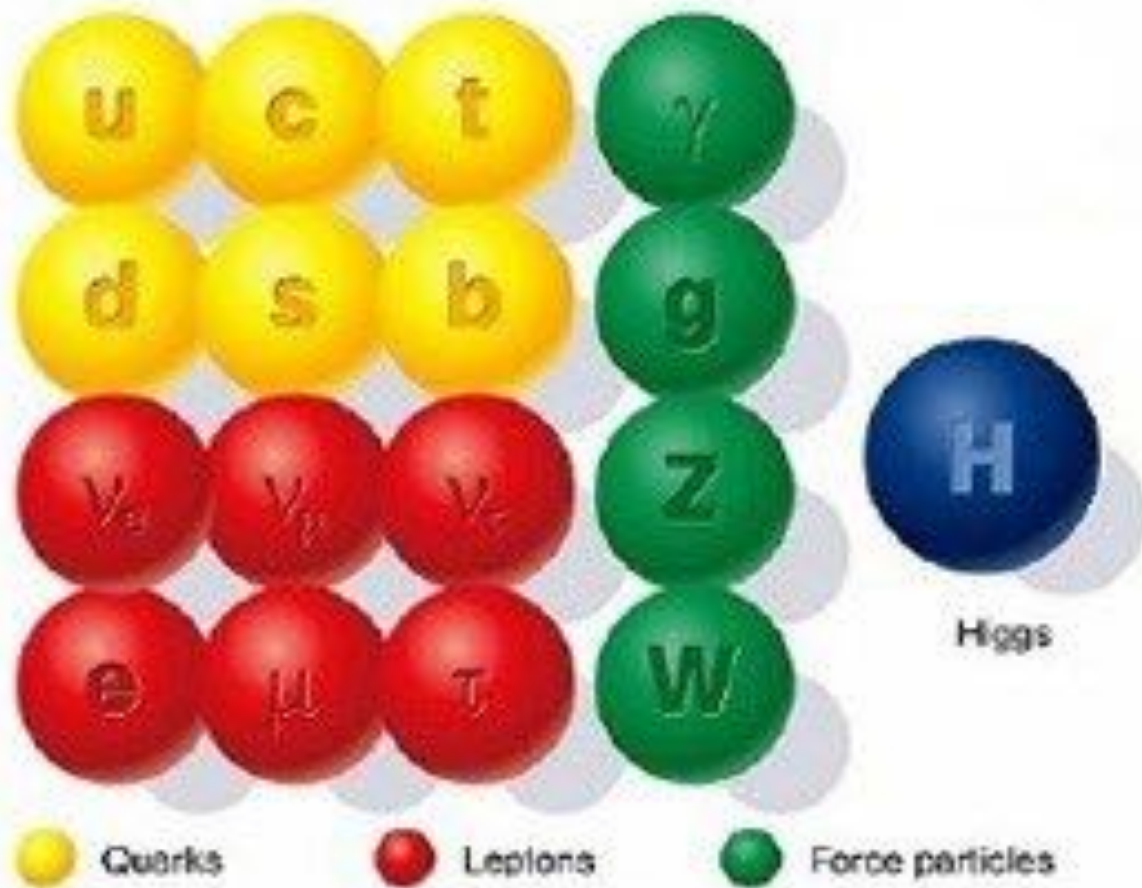


Top Corridor Analysis

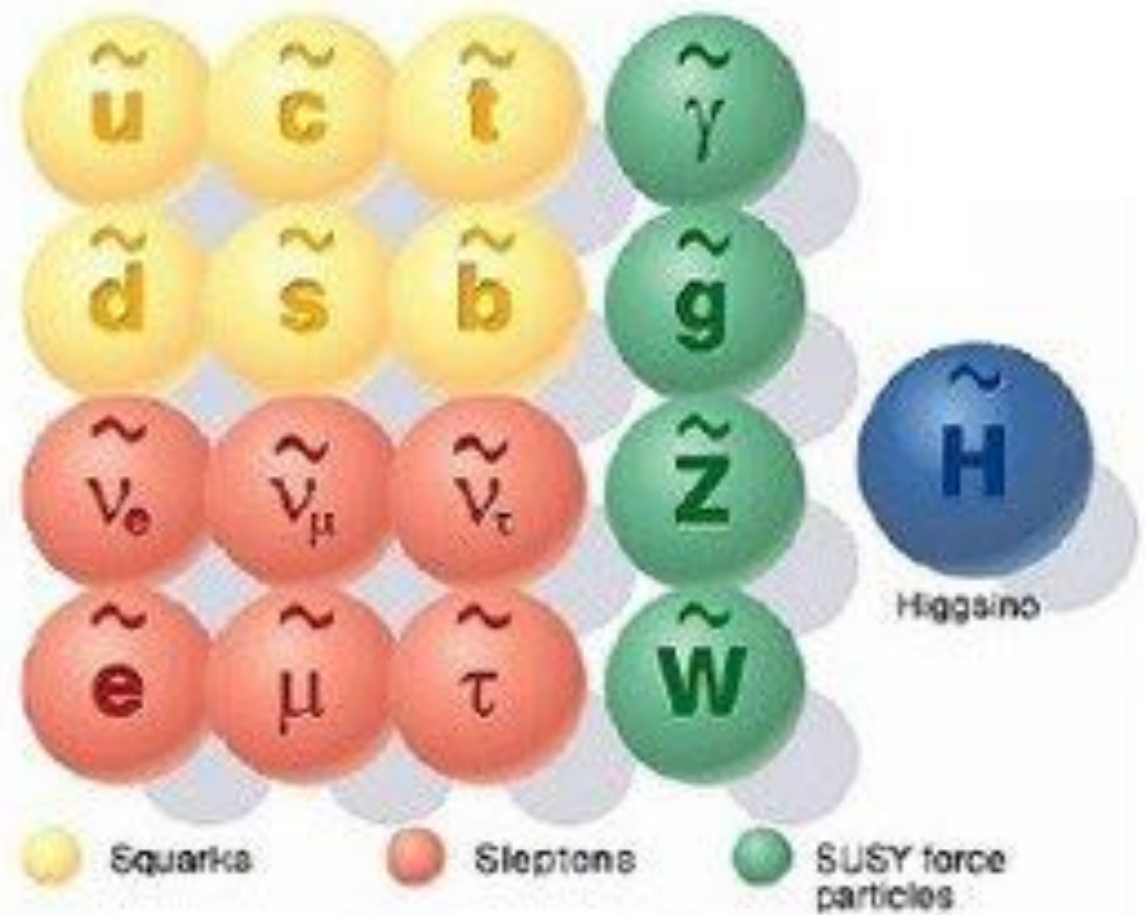
Emily Jiang, Hannsjörg Weber

Supersymmetry

SUPERSYMMETRY



Standard particles



SUSY particles

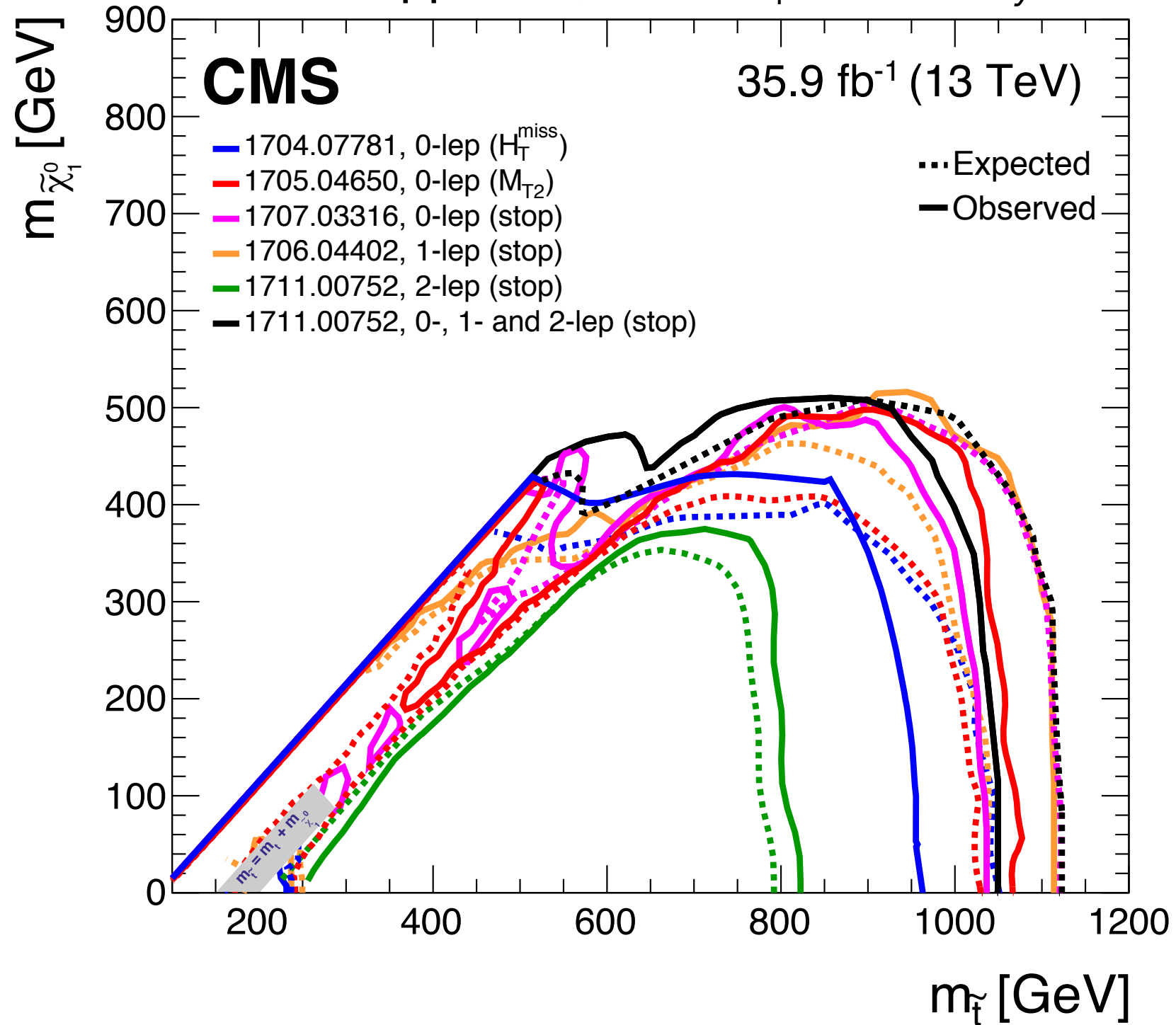
Why Supersymmetry?

- Hierarchy problem
- Dark matter candidate
- Force unification, etc.

Top Corridor

$$pp \rightarrow \tilde{t}\tilde{t}^*, \tilde{t} \rightarrow t \tilde{\chi}_1^0$$

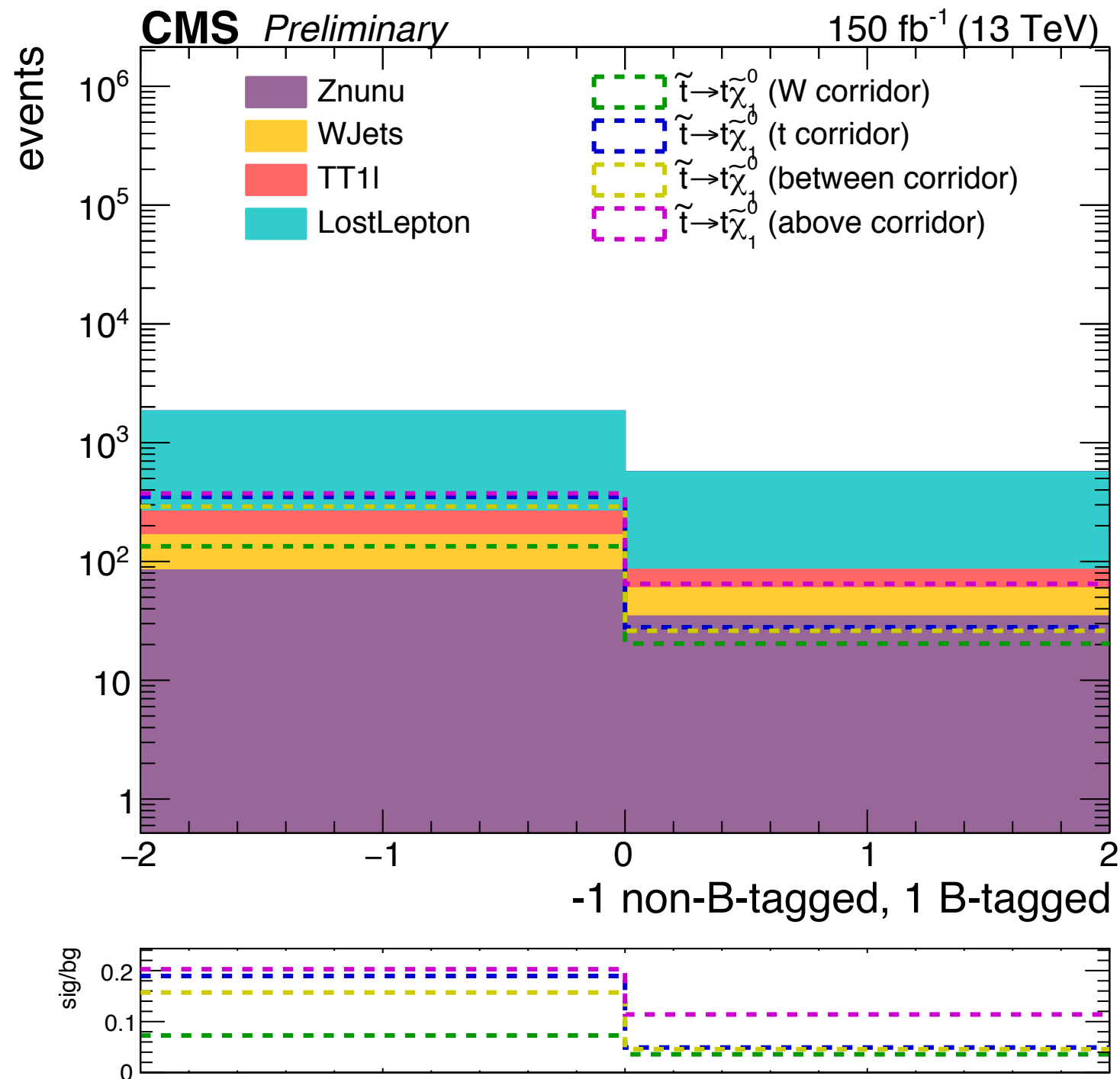
July 2018



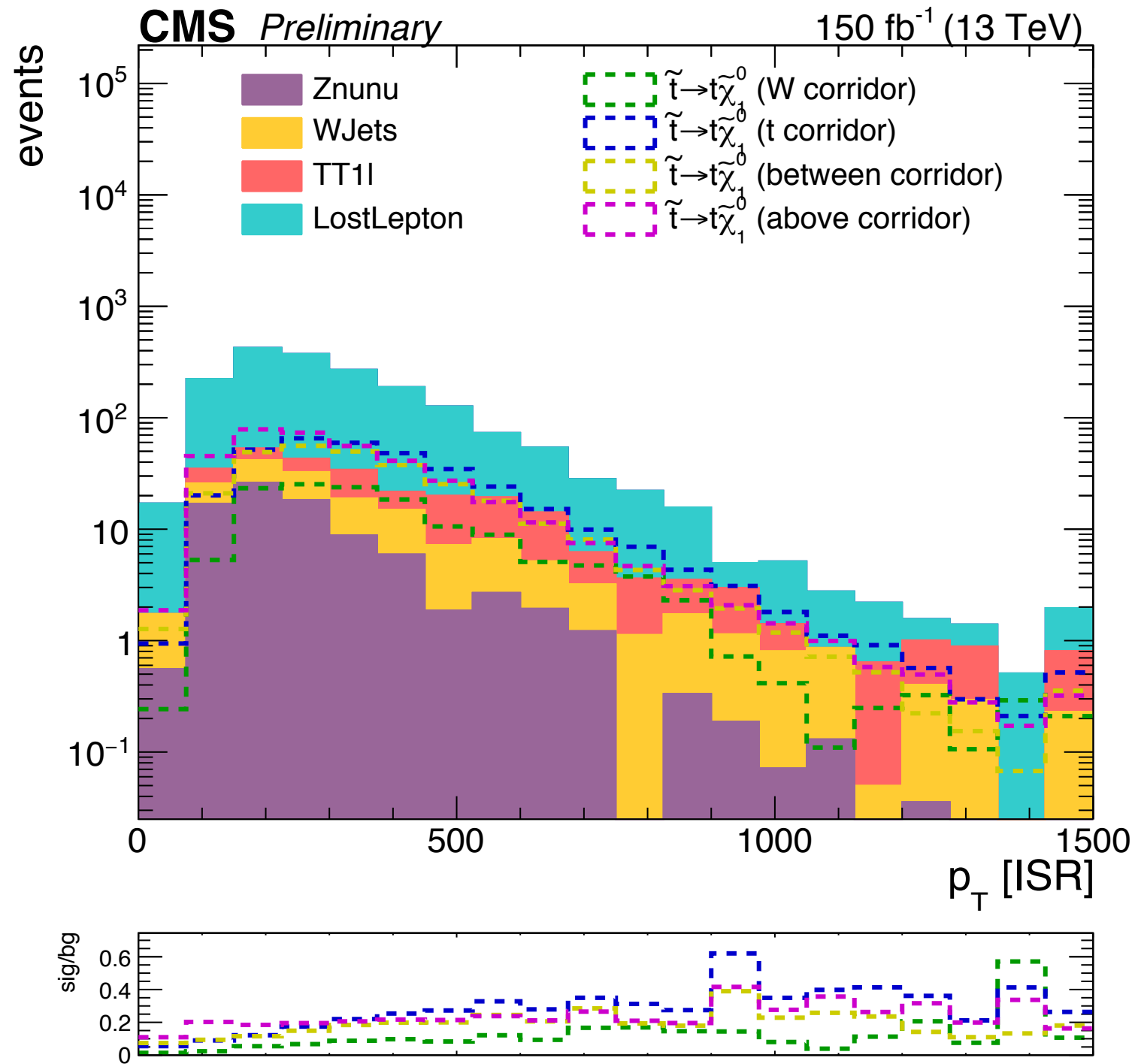
Event Topology

Decay Event

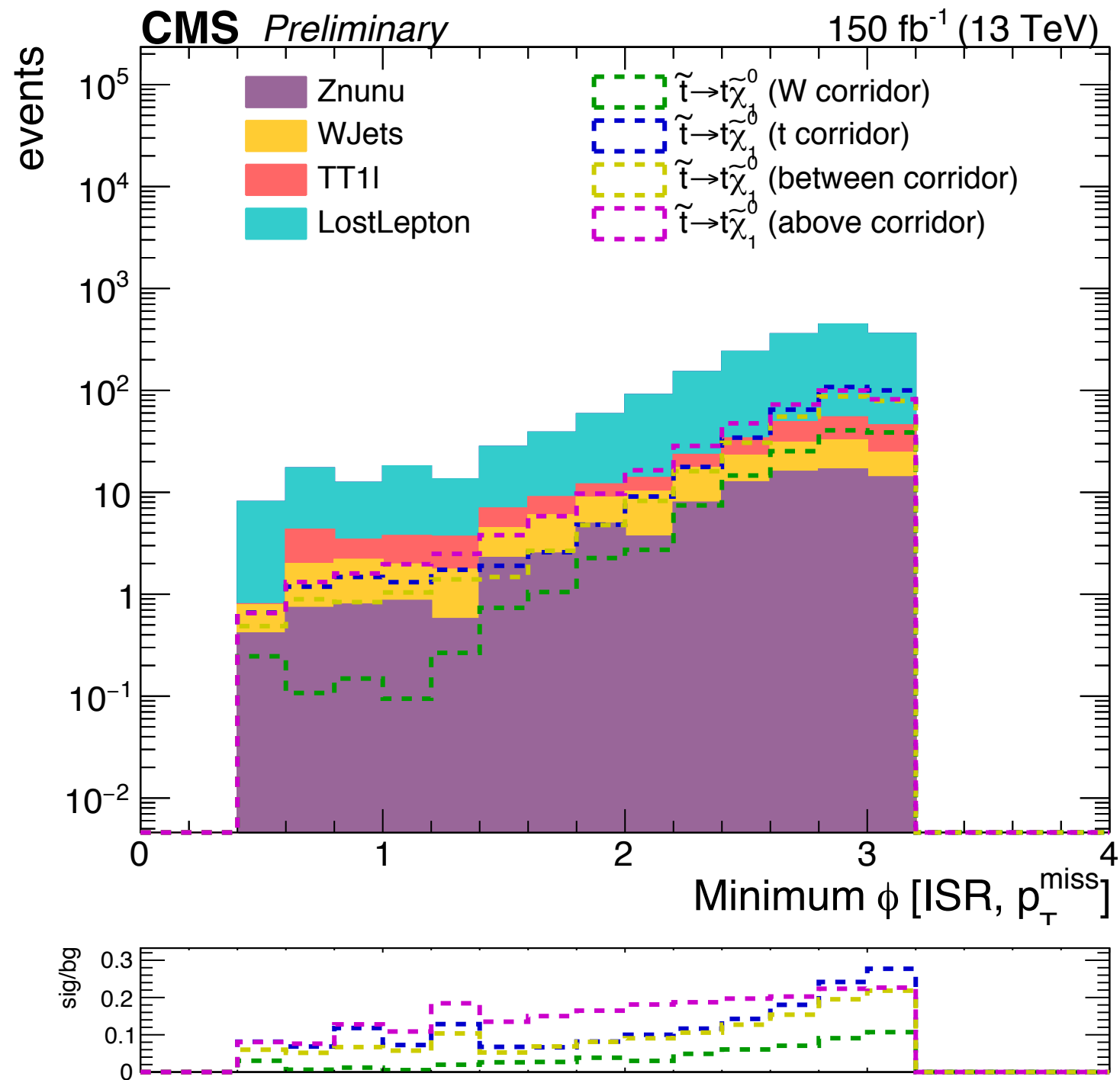
ISR Jet B-Tagged?



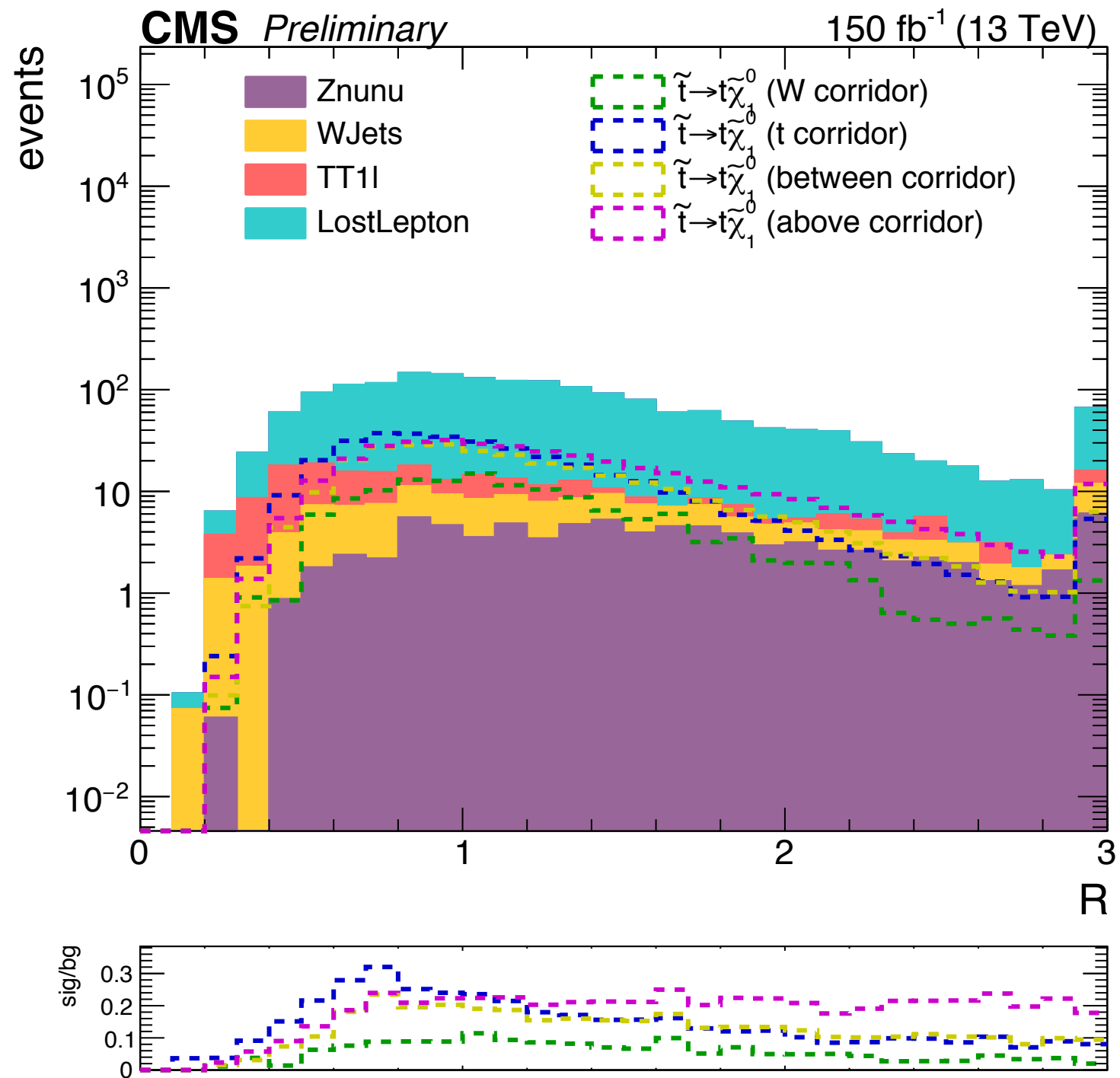
$p_T^{\text{ISR}} > 250 \text{ GeV}$



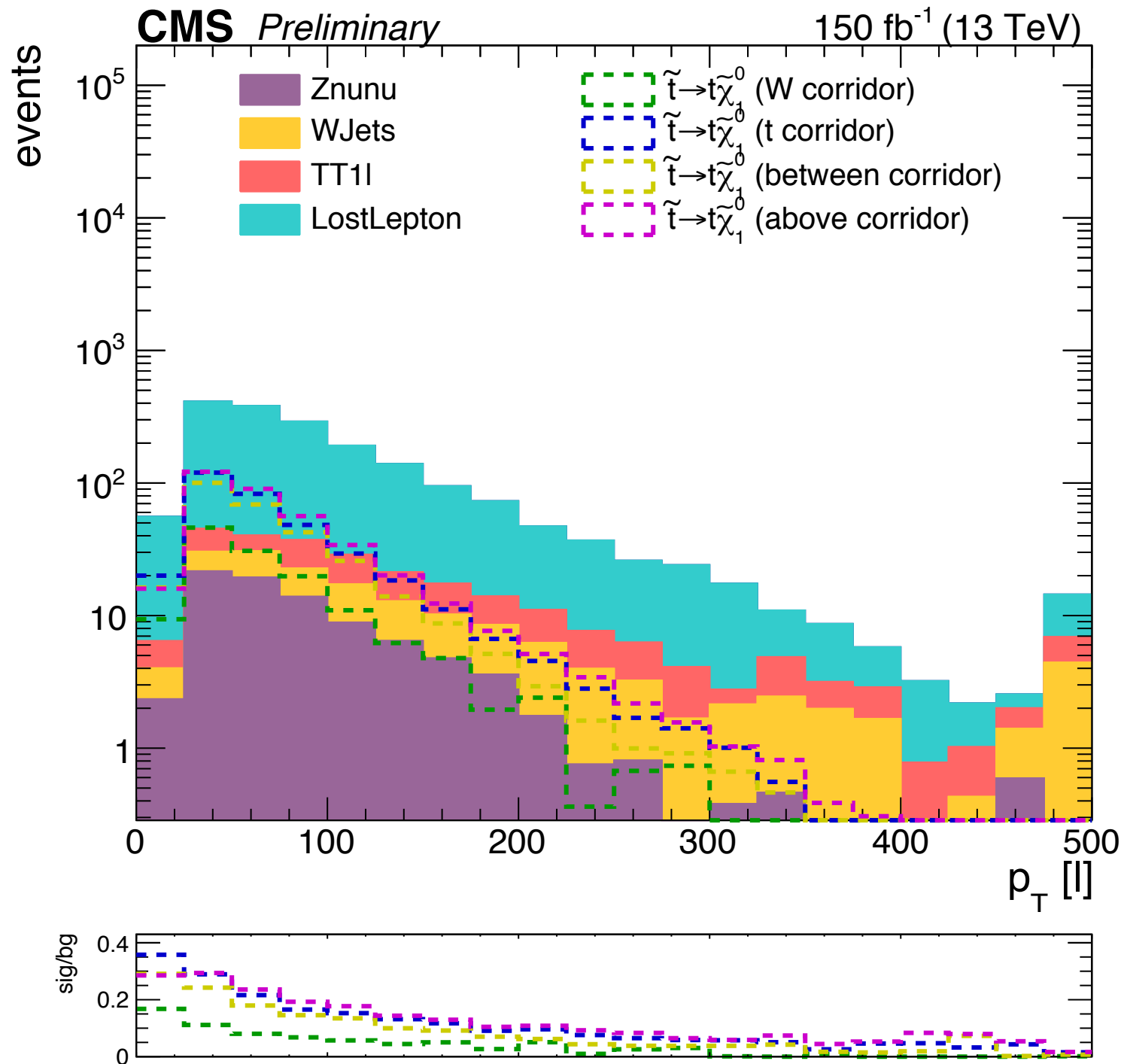
$\Delta\Phi$ (ISR Jet, MET) > 2



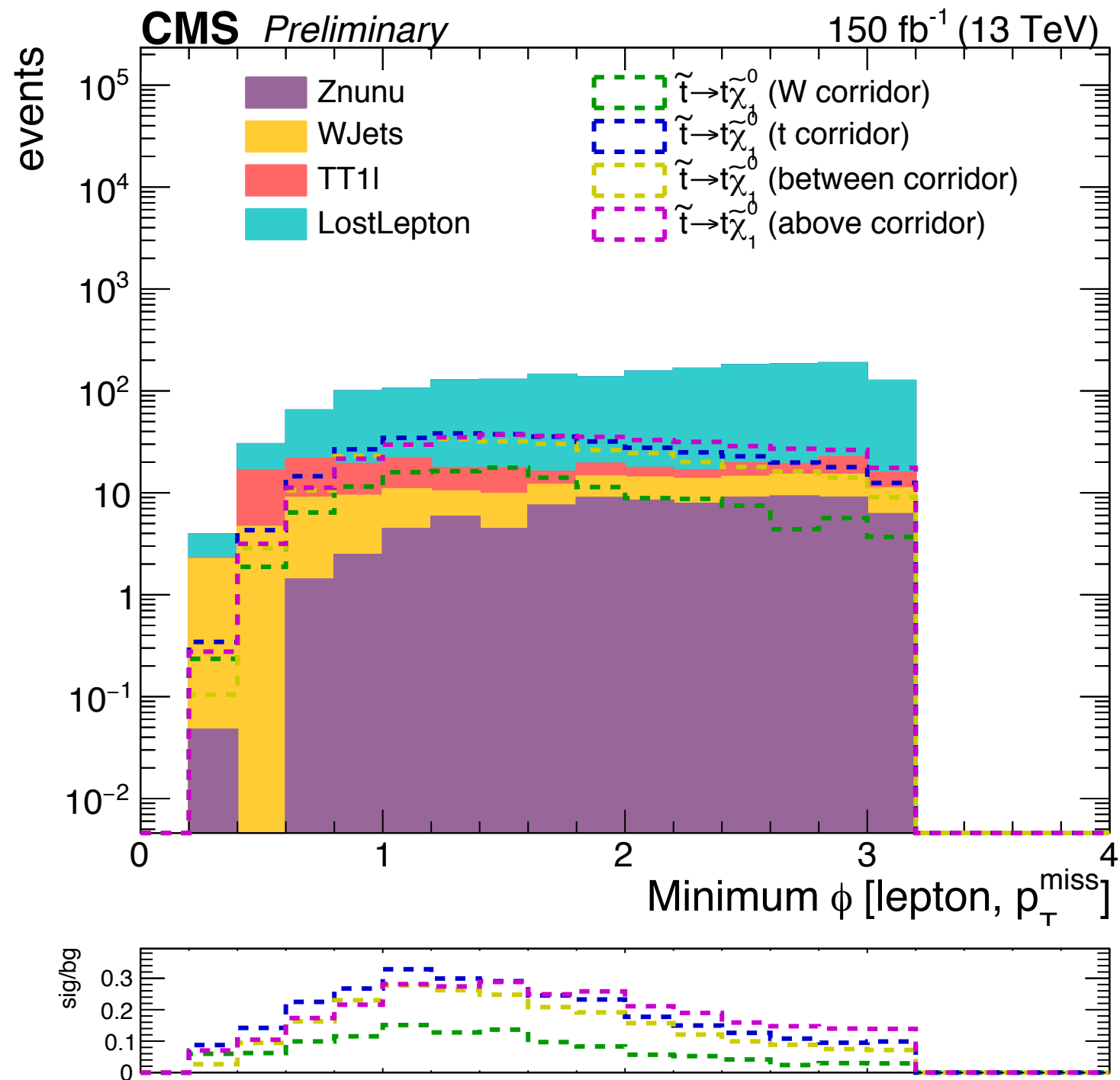
0.5 < R < 2



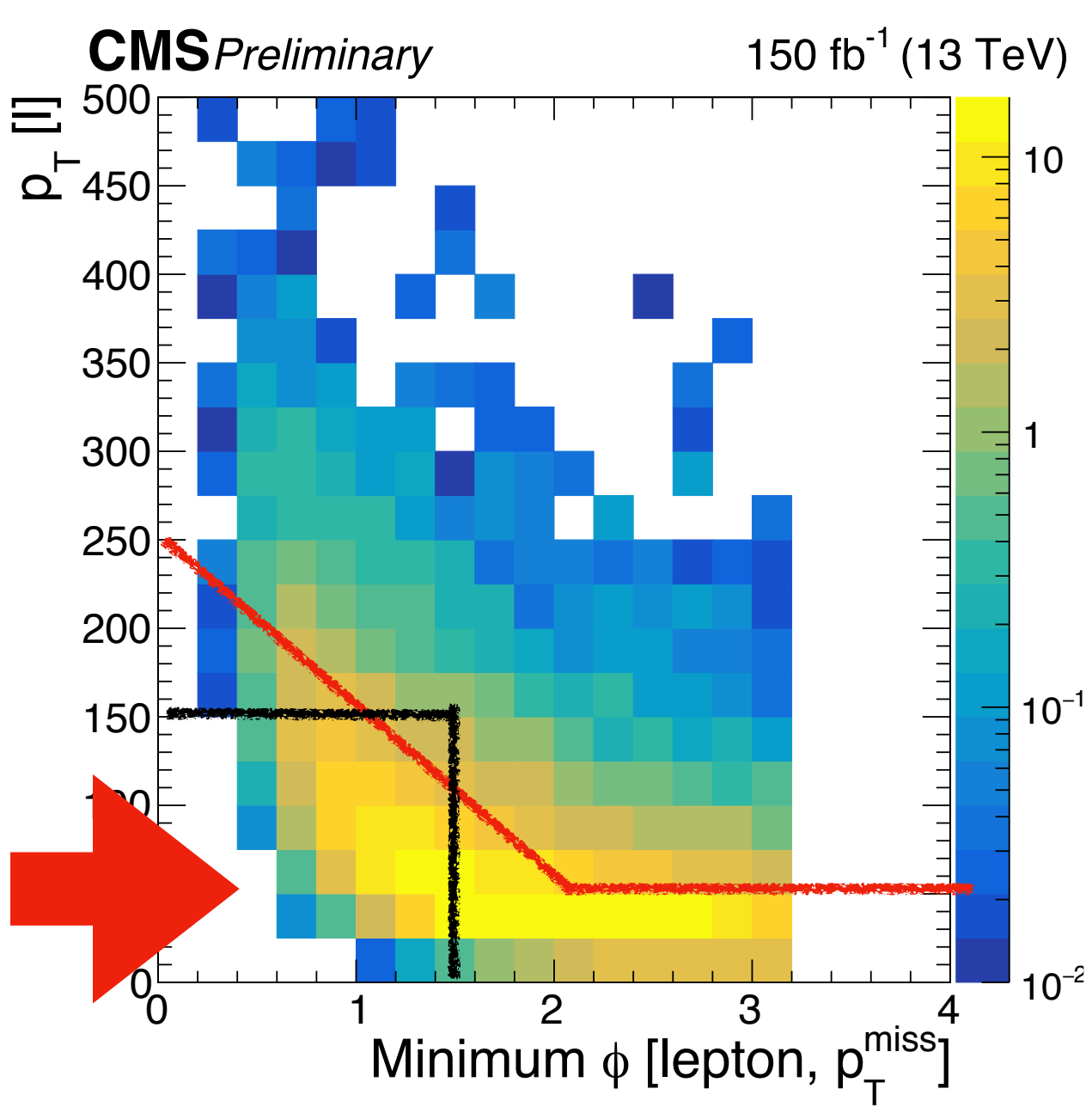
$p_T^{\text{Lepton}} < 150 \text{ GeV}$



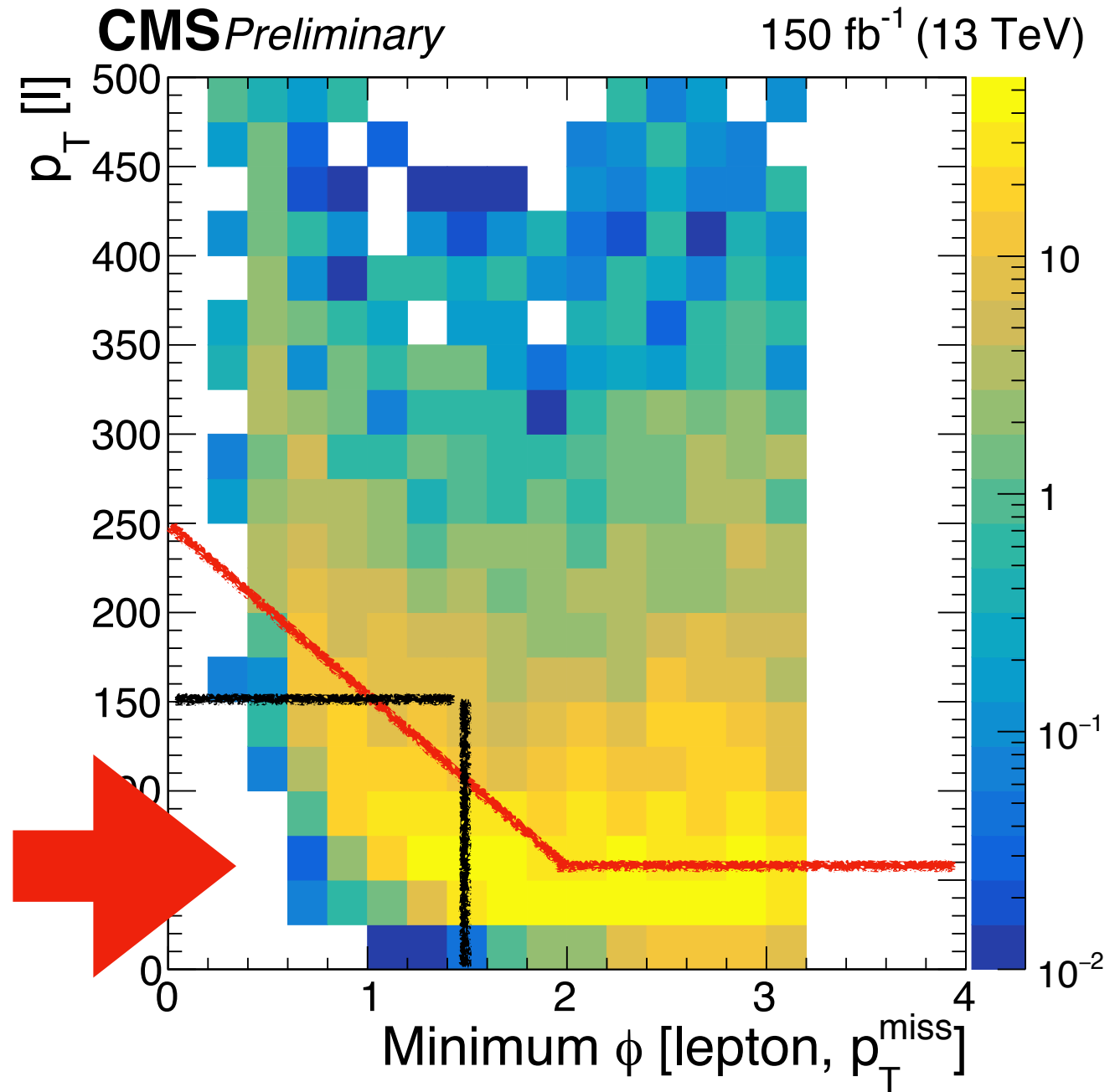
$\Delta\Phi$ (Lepton, MET) < 1.5



Shape Cut



Signal

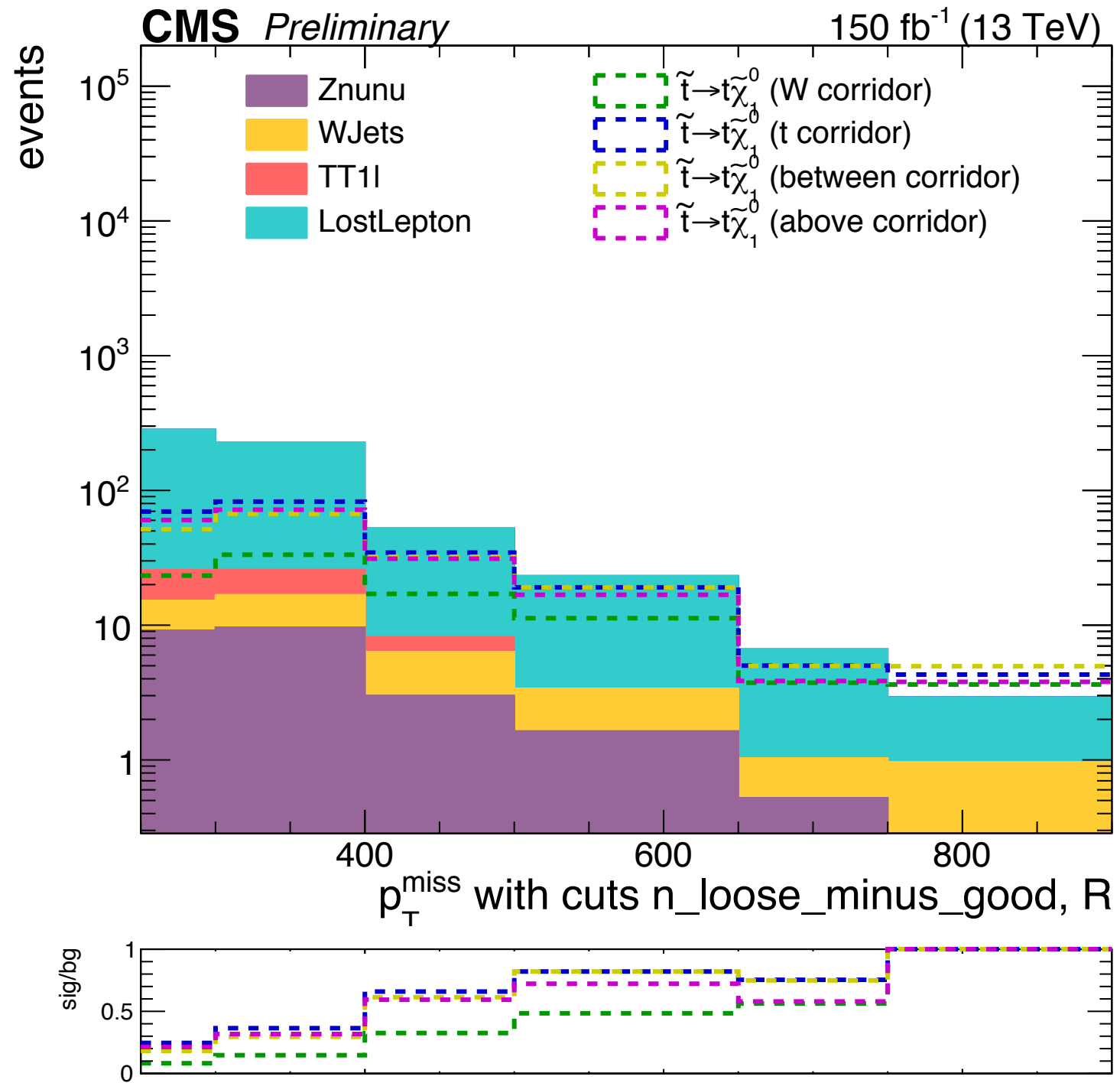


Background

Process

- We look at several sensitive variables
- Started with single cut or a shape cut
- Add another cut on top, investigate if sensitivity improves
- Repeat until sensitivity stops improving

MET Binning



Final Cuts With Missing E^T Binning	S/\sqrt{B}^{**}
2016 Analysis (with new MET binning)	3.293
$\Delta\Phi$ (lepton, MET), p^T lepton	3.424
Number of only loosely b-tagged jets, $\Delta\Phi$ (lepton, missing E^T), p^T lepton	3.328
$\Delta\Phi$ (lepton, MET), p^T lepton, R	3.432
Shape: Number of only loosely b-tagged jets, R	3.634
Shape: Position of first b-tagged jet, R	3.580
Shape: $\Delta\Phi$ (lepton, missing E^T)	3.578