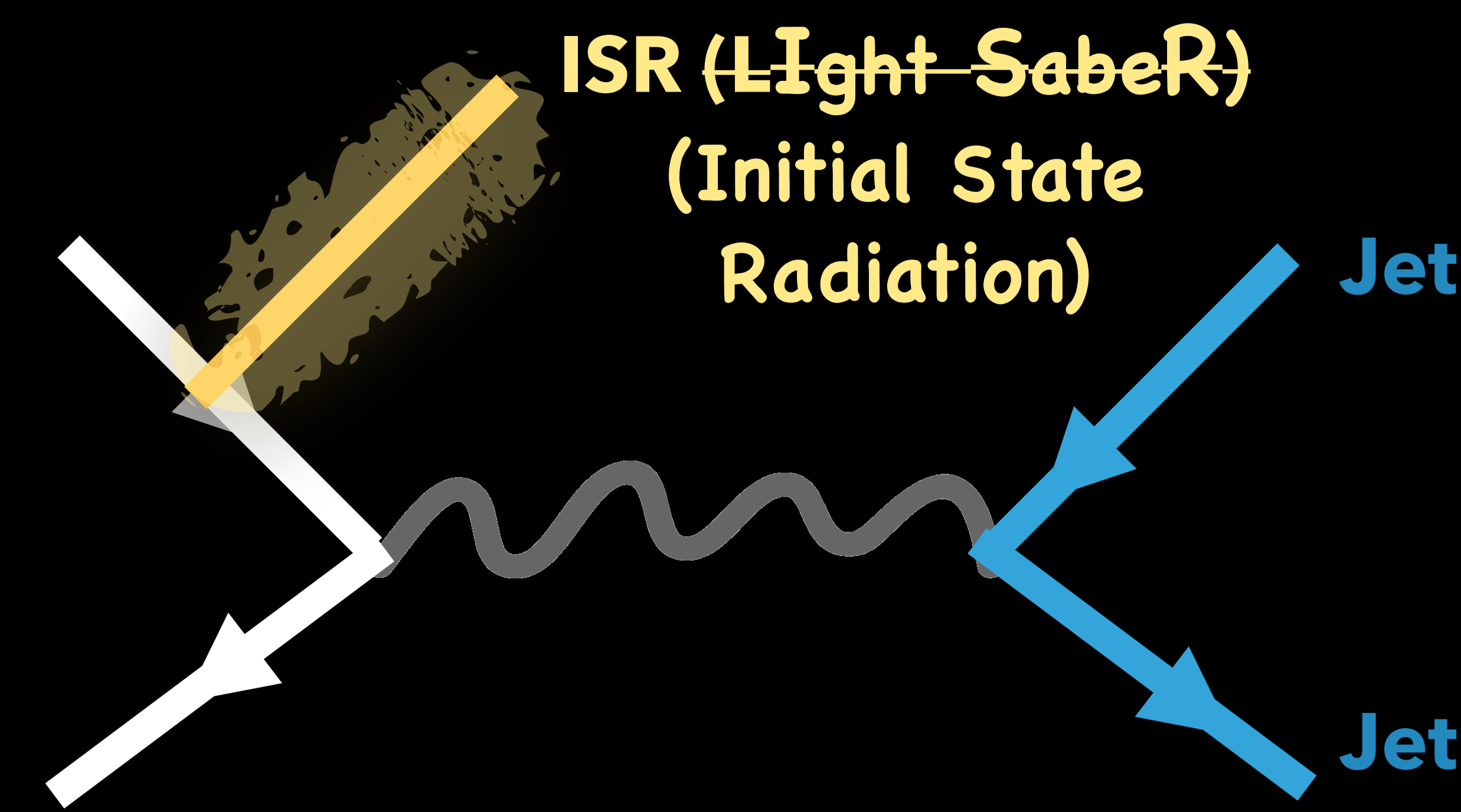


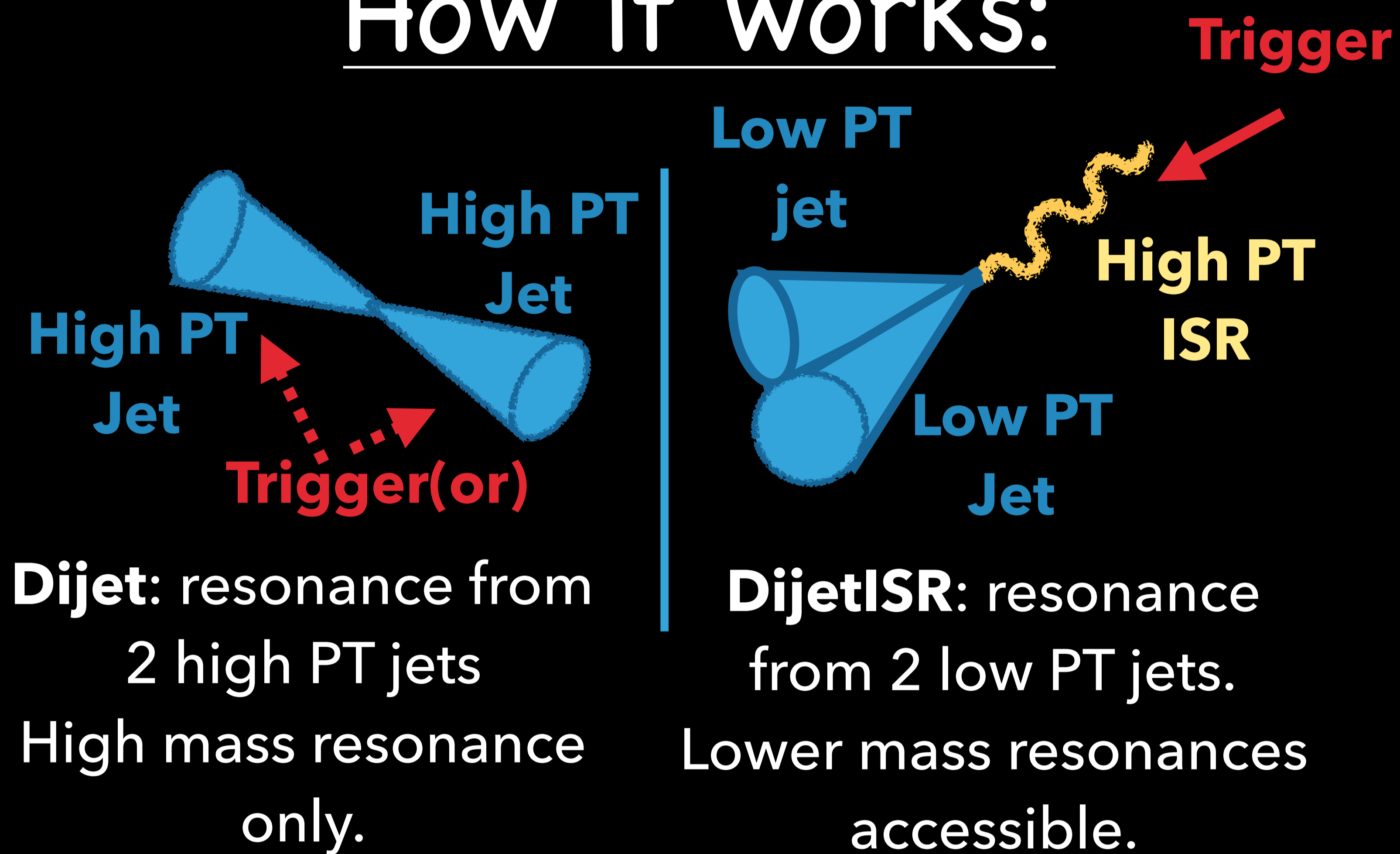
Limits in the data acquisition processing lead to trigger decisions that only save events with a high traverse momentum (PT) object. This puts a **lower mass bound** on the resonances searchable in the dijet channel.



By requiring an **ISR** and triggering on that, the lower mass bound can be further lowered.

**ISR for low mass resonances!**

How it works:



# Low mass dijet resonances search using ISR with

## ~80fb<sup>-1</sup> √s=13TeV ATLAS Data

Yvonne Ng of UC Irvine on behalf of ATLAS

### The Resonances

- SM Higgs through gluon fusion production.
- DM mediator Z' that decays into b quarks.

### BOOSTED DI-B

#### Event Selection

- Two large  $\Delta R=1.0$  jets: ISR jet & resonance jet
- Resonance jet :Highest PT large R jet with  $2m/pt < 1$  (boosted)
- Two b-tagged small R track jets within the resonance candidate.

**ISR jet for trigger**

- Pushing resonance mass to 70 GeV-230GeV

### The Resonances

- DM mediator Z'
- Gaussian limits

### RESOLVED DI-JET AND DI-B

#### Event Selection

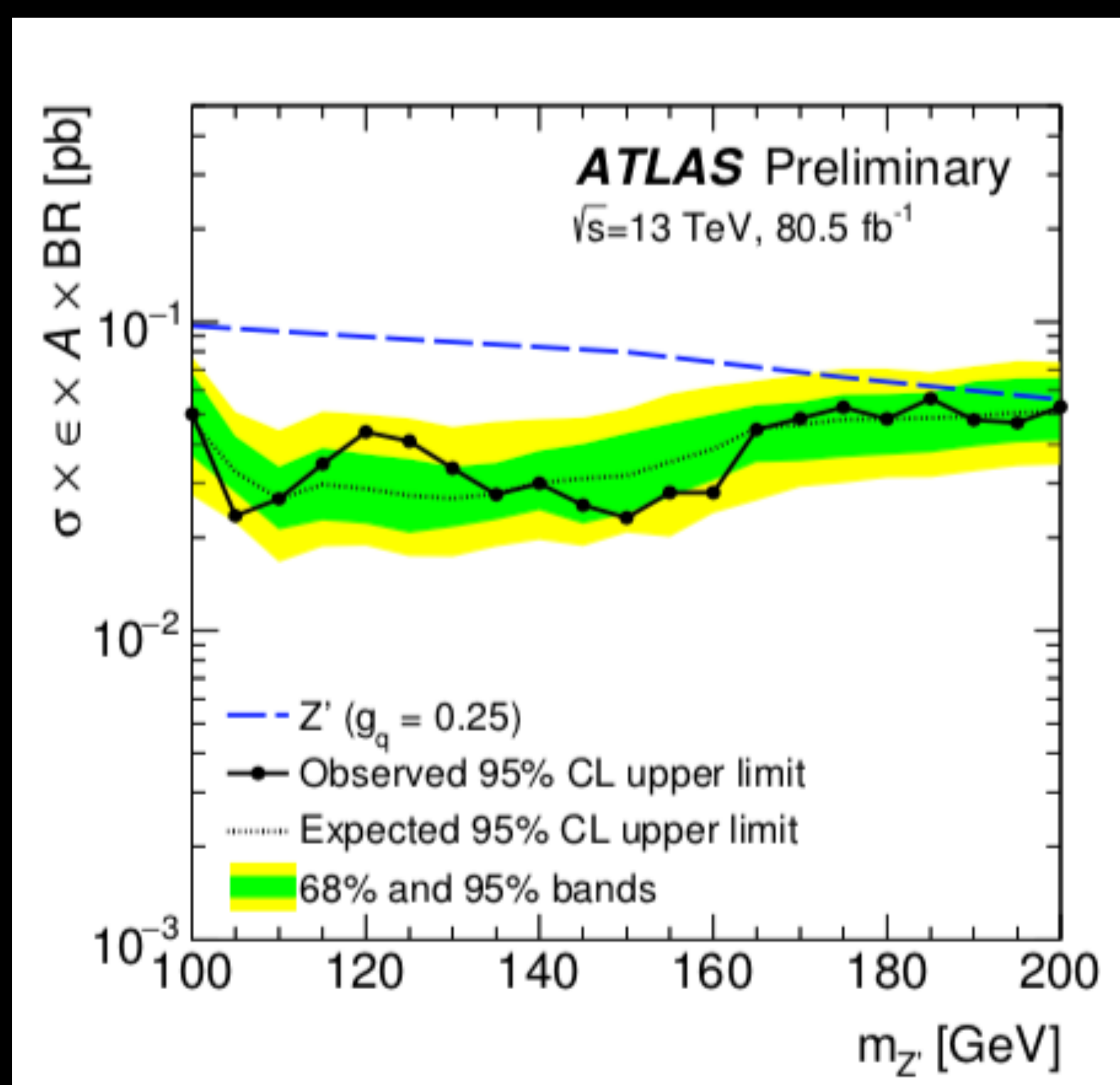
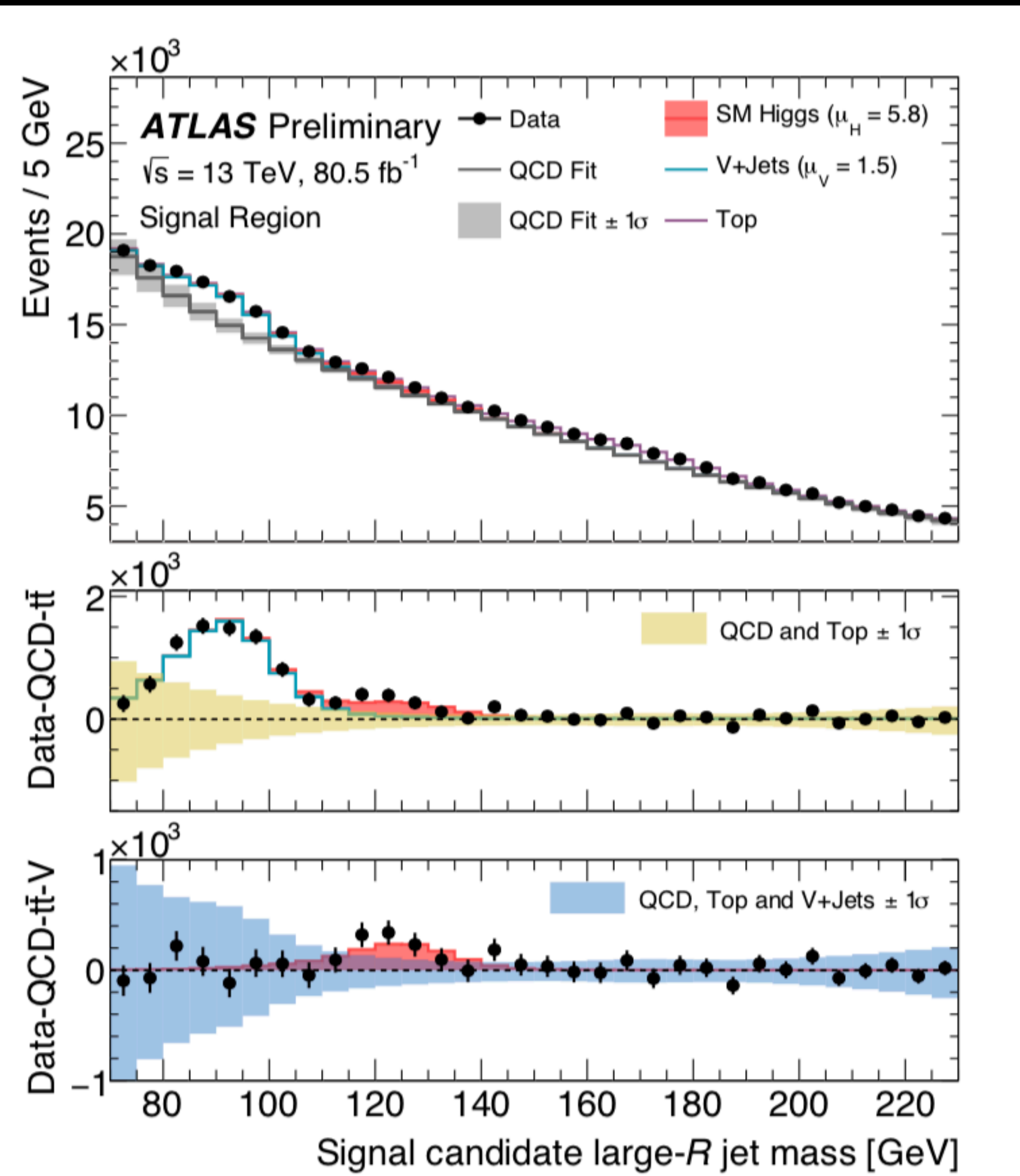
- One Leading photon and two jets
- Centrality  $|y_1 - y_2|/2 < 0.75$
- Two triggers: single photon and combined trigger of a photon and 2 jets for low mass bound and optimal sensitivity.

**ISR photon for trigger**

**Resolved jets**

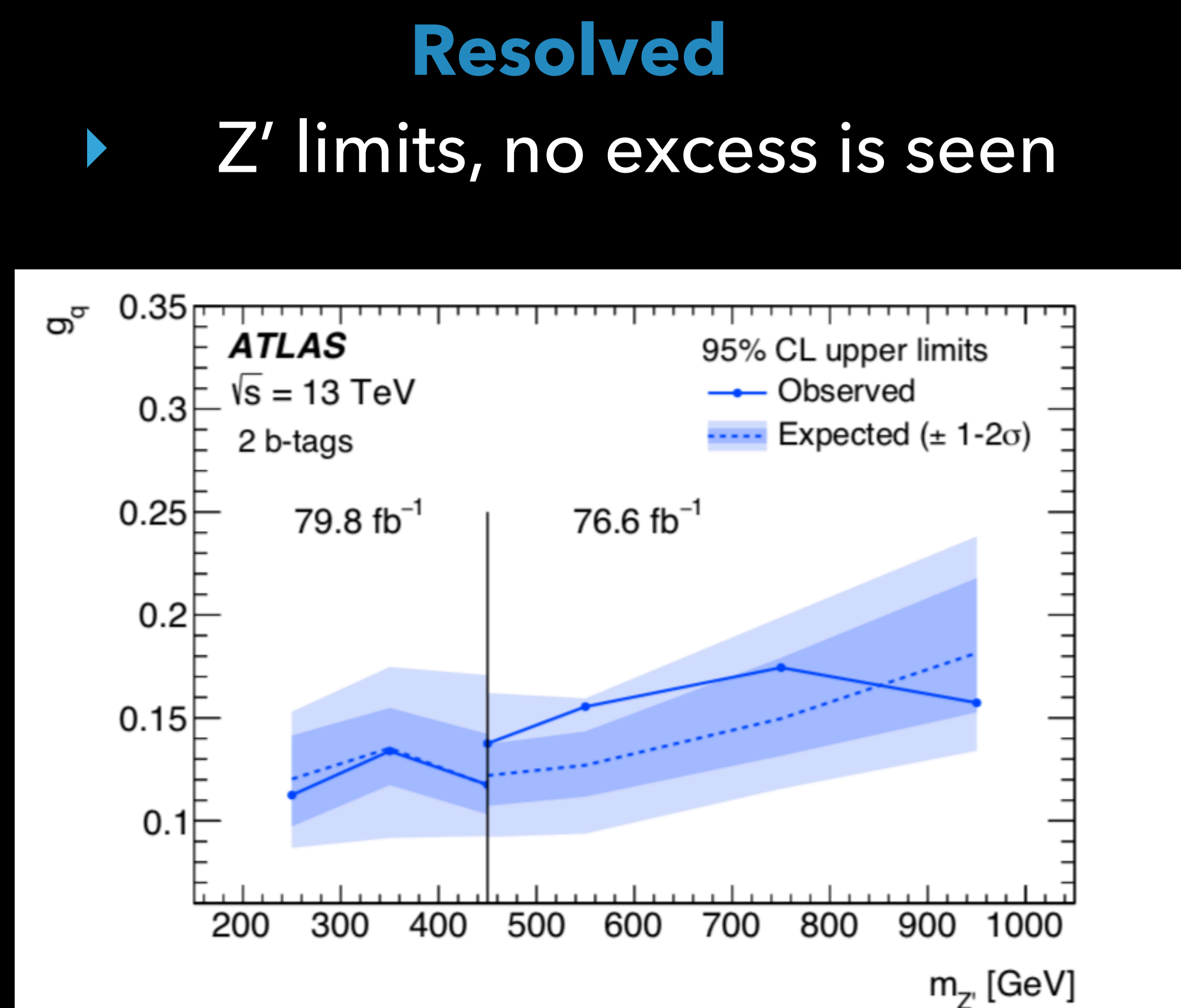
- Covers higher resonance mass (169-1200 GeV) than the boosted

## Results:



**Boosted**

Z' limits, no excess is seen  
Higgs Boson found at 5.8 sig. strength



**Resolved**

Z' limits, no excess is seen

\* Results also available on Recast.

**References:**  
Resolved: Search for low-mass resonances decaying into two jets and produced in association with a photon using p p collisions at  $\sqrt{s} = 13\text{TeV}$  with the ATLAS detector (Phys. Lett. B (2019) 56 )  
Boosted: Search for boosted resonances decaying to two b-quarks and produced in association with a jet at  $\sqrt{s} = 13\text{TeV}$  with the ATLAS detector (ATLAS-Conf 2018-052\_