

Search for SUSY with missing transverse momentum and multiple b-jets with the ATLAS detector

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on behalf of the SUSY Strong Multi-b Group



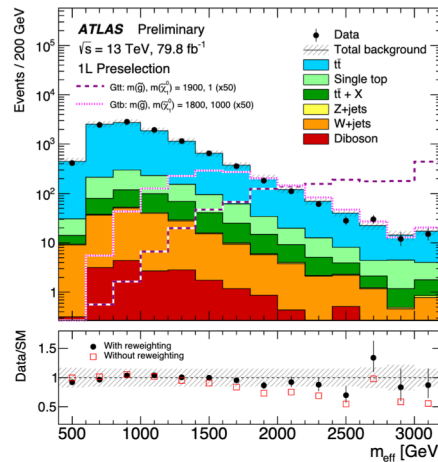
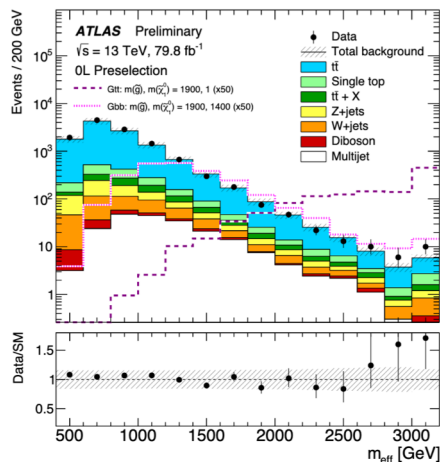
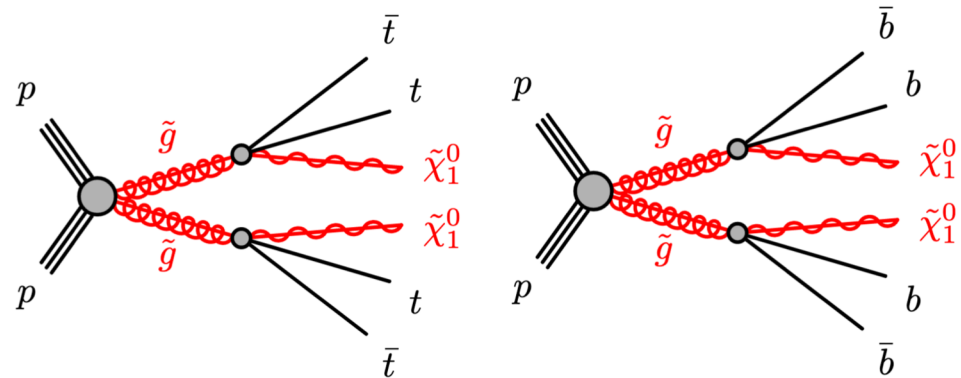
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The Simplified Models

Target gluino pair production with off-shell top (left) and bottom (right) squarks in their decay products

- Potentially **high cross-section** for gluino pair production
- Targeting **final states** with large amount of E_T^{miss} and many b-jets
- Phase space is divided into **lepton veto (0L)** and **1L region** with signal lepton ≥ 1

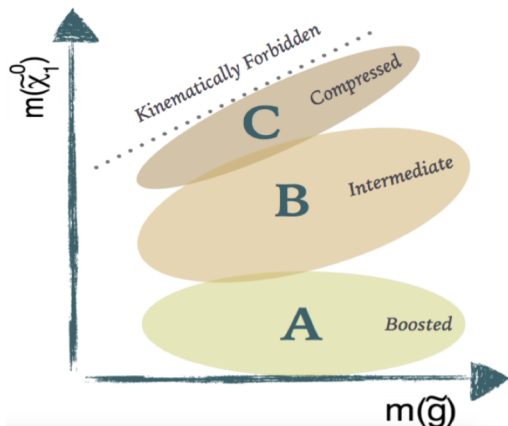


- data with good quality 79 fb^{-1}
- All backgrounds coming from simulation except “multijet” which is **data-driven**
- E_T^{miss} trigger and MV2c10 as b-tagger
- m_{eff}^{incl} **reweighting** in 1L region to have better Data/MC agreement in tail

Region Definition and Analysis Strategy

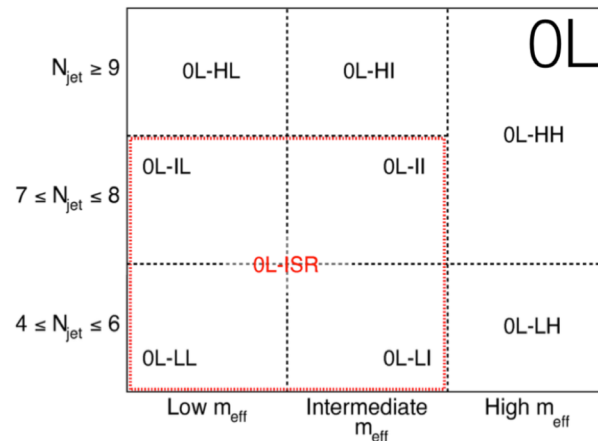
Cut-and-count approach:

- partially-overlapping single-bin signal regions
- optimized to **maximize** the SUSY discovery power
- used in **background-only fit** results



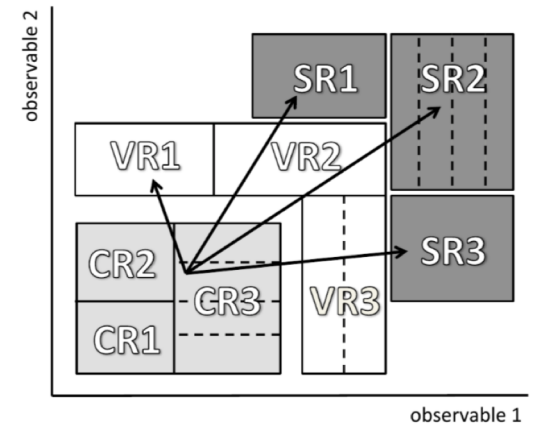
Multi-bin approach:

- **orthogonal regions** using jet multiplicity and effective mass slices
- Non-overlapping regions
- used in **exclusion fit** results



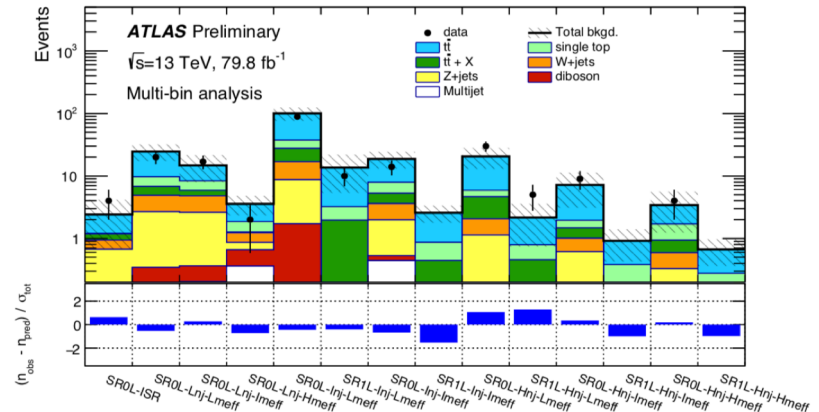
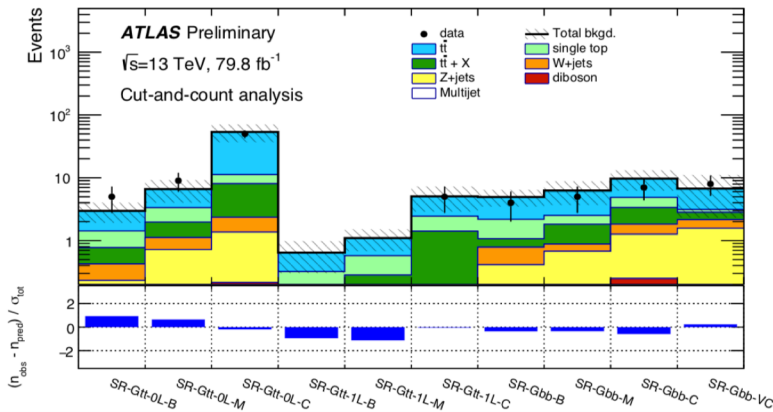
Analysis strategy:

- **semi data-driven** approach using CRs to normalize largest background ($t\bar{t}$)
- Validate this approach using designed VRs
- Largest **systematics**: JES, JER, and b-tag efficiency



Fit Results

Result of the background-only fit extrapolated to the signal regions for cut-and-count (left) and multi-bin (right). All experimental and theoretical uncertainties are included in the fit.



Exclusion limits for Gtt (left) and Gbb (right) models.

Glucinos with masses below 2.2 TeV are excluded at 95% confidence level. Exclusion limits on the LSP mass is up to 1.3 TeV.

