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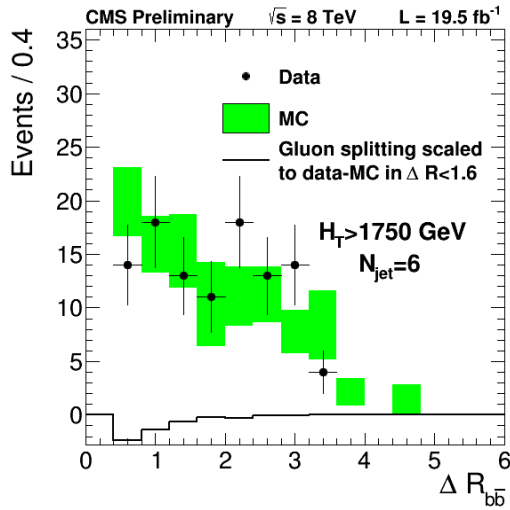
# Search for R-parity-violating supersymmetry in proton-proton collisions at $\sqrt{s} = 8$ CMS.TeV in events with large jet and b-jet multiplicity

## Abstract

Preliminary results are reported from a search for new physics beyond the standard model (SM) in proton-proton collisions at a center-of-mass energy  $\sqrt{s}=8$  CMS.TeV, focusing on the signature of large multiplicity of jets and b-tagged jets. The data sample comprises an integrated luminosity of  $19.5 \text{ fb}^{-1}$ , recorded by the CMS experiment at the Large Hadron Collider (LHC). The results are used to exclude gluinos with  $m_{\text{gluino}} < 980 \text{ CMS.GeV}$  in an R-parity violating supersymmetric extension of the standard model in which each gluino decays to tbs.

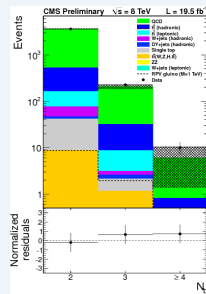
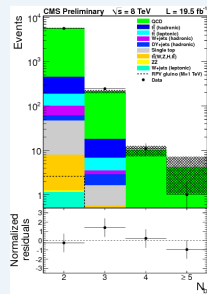
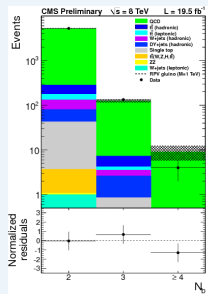
## Plots for analysis of fully hadronic final state

<p>Model RPV</p>	<p><a href="#">PDF</a> <a href="#">PNG</a></p> <p>PNG</p> <p>Feynman diagram for pair production of gluinos decaying to tbs.</p>
<p>CMS Preliminary <math>\sqrt{s} = 8 \text{ TeV}</math> <math>L = 19.5 \text{ fb}^{-1}</math></p> <p>Events / (0.01)</p> <p>CSV</p> <p>Legend: Data (black dots), Sum (solid blue), b jets (dotted red), c jets (dotted black), light jets (dotted blue), Non-QCD (dotted green)</p>	<p><a href="#">PDF</a> <a href="#">PNG</a></p> <p>PNG</p> <p>Fit to the CSV distribution in data for <math>4 \leq N_{\text{jet}} \leq 5</math>, <math>H_T &gt; 1.1 \text{ CMS.TeV}</math> and CSV b-tagging discriminant <math>&gt; 0.9</math>. Error bars indicate the statistical uncertainty arising from MC statistics.</p>
	<p><a href="#">PDF</a> <a href="#">PNG</a></p> <p>PNG</p> <p>Data (dots with error bars), uncorrected</p>



MC prediction (green band), and truth-matched gluon splitting events scaled to the data-MC difference in  $\Delta R < 1.6$  (black histogram) in a typical signal region corresponding to  $H_T > 1750$  CMS.GeV and  $N_{jet} = 6$ .

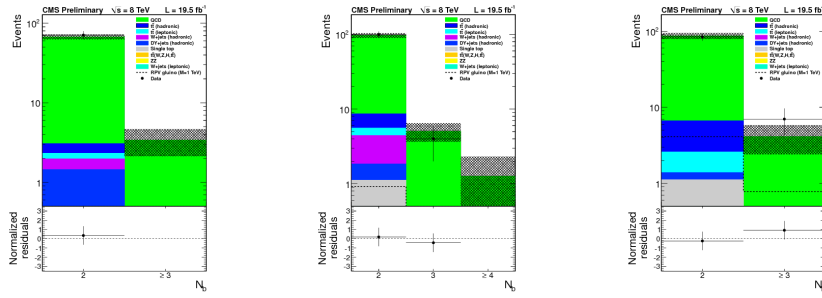
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Data (dots with error bars) and the corrected prediction of the  $N_b$  distribution are shown. The shaded band shows the MC statistical uncertainty. Events are required to have  $1000 < H_T < 1750$  CMS.GeV. The jet multiplicity requirements are  $N_{jet} = 4$  (left),  $N_{jet} = 5$  (middle), and  $N_{jet} = 6$  (right).

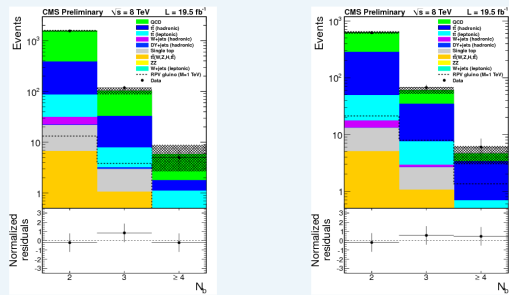
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Data (dots with error bars) and the corrected prediction of



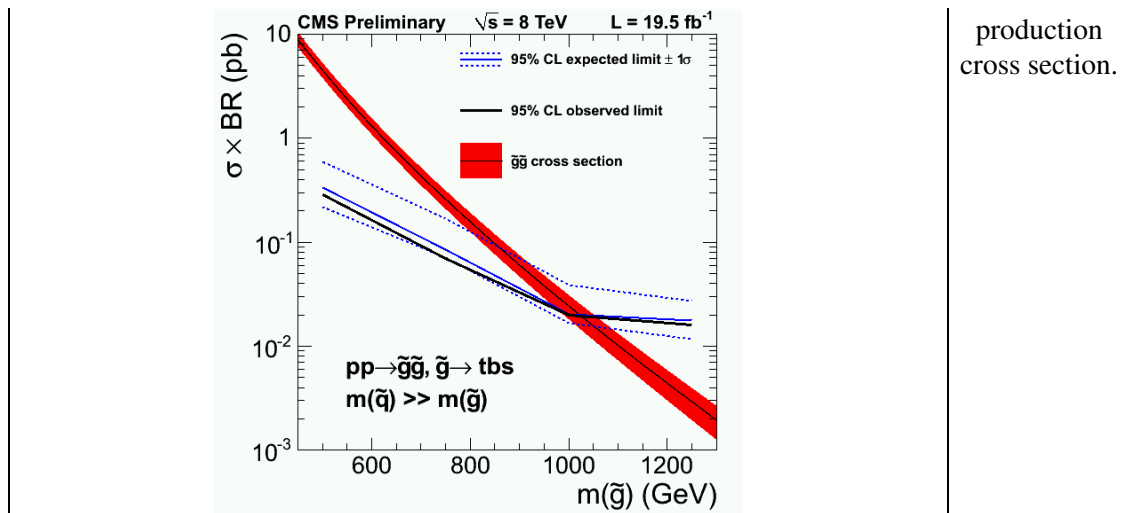
the  $N_b$  distribution are shown. The shaded band shows the MC statistical uncertainty. Events are required to have  $H_T > 1750$  CMS.GeV. The jet multiplicity requirements are  $N_{jet} = 4$  (left),  $N_{jet} = 5$  (middle), and  $N_{jet} = 6$  (right).

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Data (dots with error bars) and the corrected prediction of the  $N_b$  distribution in the high  $N_{jet}$  signal region. The shaded band shows the MC statistical uncertainty. Events are required to have  $1000 < H_T < 1750$  CMS.GeV. The jet multiplicity requirements are  $N_{jet} = 7$  (left) and  $N_{jet} \geq 8$  (right).

	<p style="text-align: center;"> <a href="#">PDF</a> <a href="#">PNG</a>                  PNG             </p> <p>Data (dots with error bars) and the corrected prediction of the <math>N_b</math> distribution in the high <math>N_{jet}</math> signal region. The shaded band shows the MC statistical uncertainty. Events are required to have <math>H_T &gt; 1750</math> CMS.GeV. The jet multiplicity requirements are <math>N_{jet} = 7</math> (left) and <math>N_{jet} \geq 8</math> (right).</p>
	<p style="text-align: center;"> <a href="#">PDF</a> <a href="#">PNG</a>                  PNG             </p> <p>Signal efficiencies as a function of <math>m_{gluino}</math> for <math>N_b \geq 2</math>, <math>H_T &gt; 1.0</math> CMS.TeV, and <math>N_{jet} \geq 6</math>, together with the breakdown among <math>N_{jet}</math> bins.</p>
<p>Expected and observed limits in the all-hadronic gluino tbs analysis. The red band is the gluino pair</p>	<p style="text-align: center;"> <a href="#">PDF</a> <a href="#">PNG</a>                  PNG             </p>



-- ChrisWest - 2015-08-19

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