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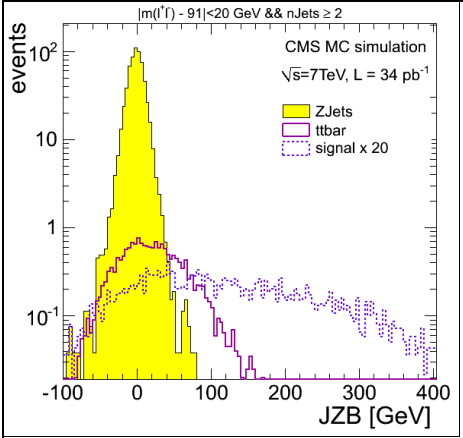
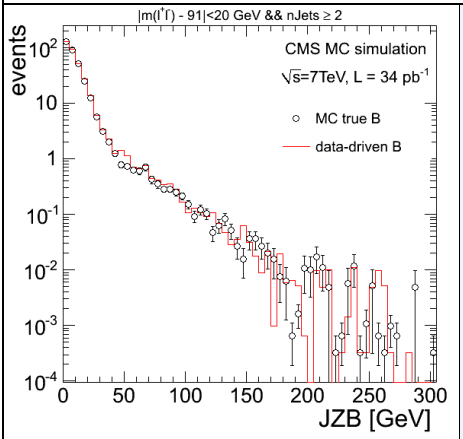
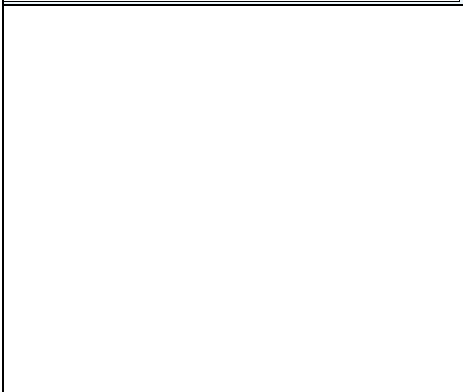
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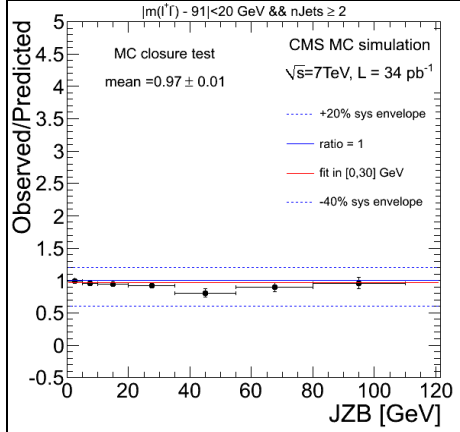
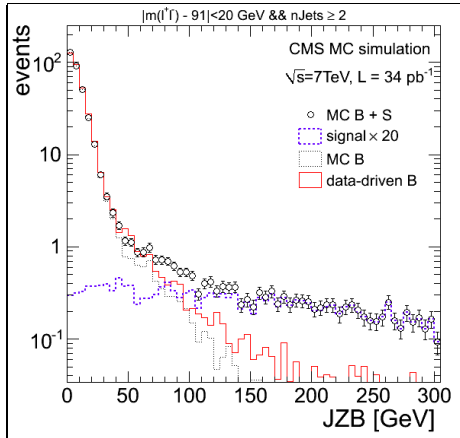
# Search for Physics Beyond the Standard Model in Z + MET + Jets events at the LHC

## Abstract

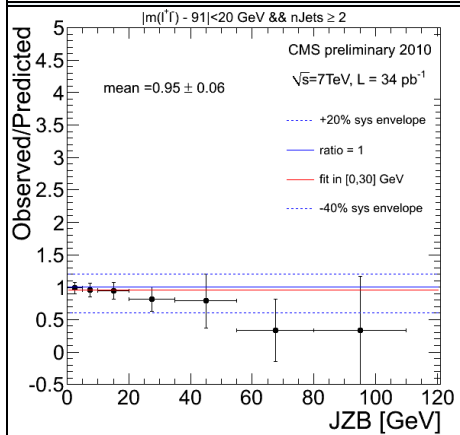
This paper presents a new approach for physics beyond the Standard Model searches in final states with a Z boson, jets and missing transverse energy. The Jet-Z Balance method is introduced and used to estimate the total background expected in the signal region directly from the data. First results with a data sample collected with the CMS detector at the LHC are presented. The size of the data sample corresponds to an integrated luminosity of  $34 \text{ pb}^{-1}$ . In the absence of any significant excess beyond the SM expectation, upper limits are set on two benchmark scenarios and further information is provided to allow testing the exclusion of specific models of physics beyond the SM.

## Approved Plots from SUS-10-010 ( *click on plot to get .pdf* )

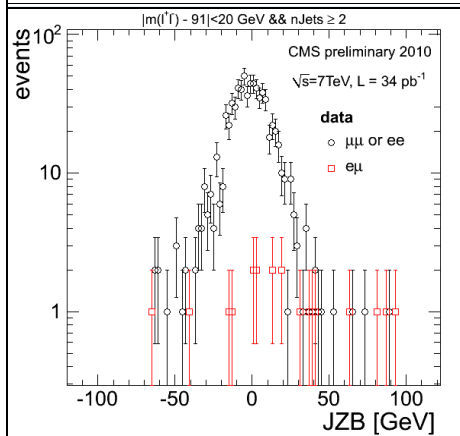
Figure	Abbreviated Caption
	<p>JZB distribution in Z + jets, <math>t\bar{t}</math> and SUSY MC simulation, scaled to <math>34 \text{ pb}^{-1}</math>. The signal distribution corresponds to the SUSY LM4 scenario, scaled by a factor of 20 in cross-section. [ EPS ]</p>
	<p>Comparison of the predicted background distribution (solid line) and the observed SM background distribution (dots) in the <math>JZB &gt; 0</math> region, in SM MC simulation [ EPS ]</p>
	<p>Comparison of the predicted background distribution (solid line) and the observed SM background distribution (dots) in SM MC simulation including a SUSY signal. The true SM background (dotted line) and SUSY signal (dashed line) are also shown separately. [ EPS ]</p>



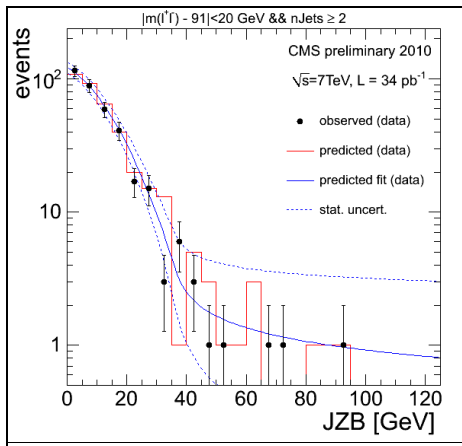
Ratio of observed to predicted number of events in bins of JZB in the SM MC simulation. The solid red line shows the mean of this ratio, the solid blue line shows the position of unity and the dashed lines show the assigned systematic uncertainty.  
[ EPS ]



Ratio of observed to predicted number of events in bins of JZB in the ee and μμ data sample. The solid red line shows the mean of this ratio, the solid blue line shows the position of unity and the dashed lines show the assigned systematic uncertainty.  
[ EPS ]



JZB distribution the SF ( $e^+e^-$  and  $\mu^+\mu^-$ ) data sample (dots) and in the OF ( $e^\pm\mu^\pm$ ) data sample (squares).  
[ EPS ]



Comparison of the predicted and observed JZB distributions in the ee and  $\mu\mu$  data sample. The background prediction has been interpolated to display the  $\pm$  uncertainty band based on Poisson statistics.

[ EPS ]

## Link to SUS-10-010 PAS in CDS [↗](#)

-- MarcoAndreaBuchmann - 27-May-2011

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