

MHT Significance

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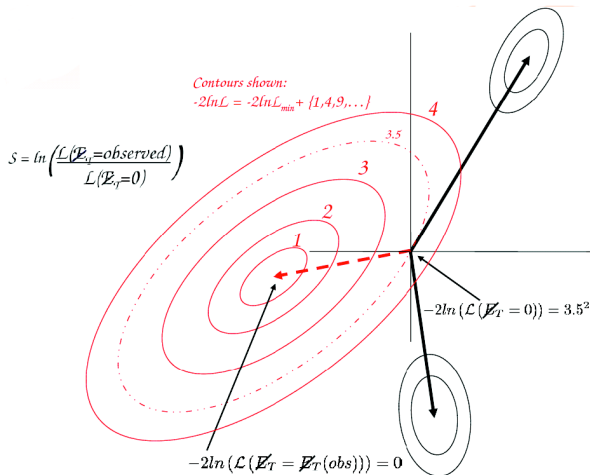


What's New?

- 1 Settled on the “object based” algorithm - **MHT** Significance
- 2 Ported the MHT Significance producer into the PAT framework
- 3 Results for Physics use $W \rightarrow e\nu$ and SUSY LM1 analysis
- 4 Used Gumbo and Chowder background samples

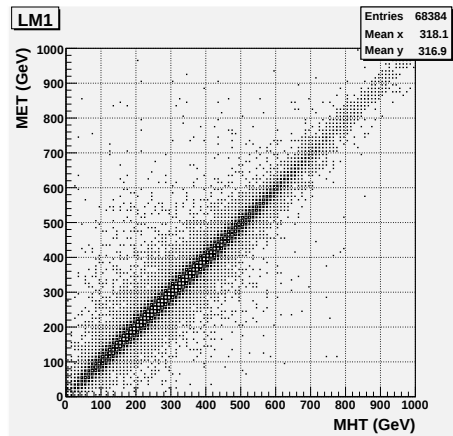
MHT Significance - Basic idea

- MHT = -sum (jets, electrons, muons)
- Include uncertainties of vectors summed up to MHT

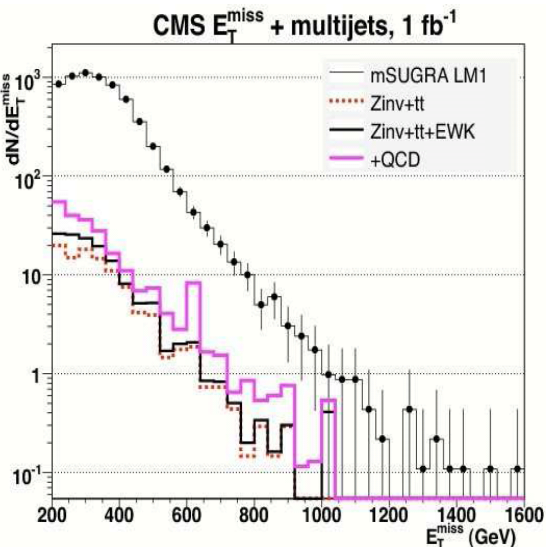


More about MHT ...

- $MHT = -\text{sum}(\text{jets, electrons, muons})$
 - Standard jets
 - No calotowers
- MHT only probes high PT kernel of the event.
- Roughly speaking, MET and MHT are interchangeable

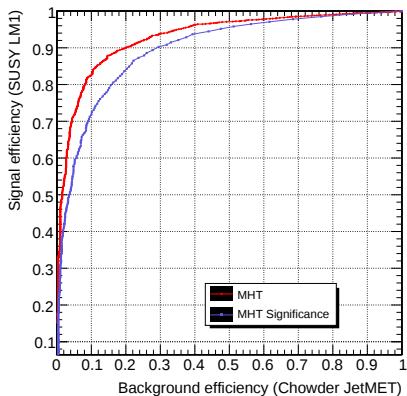
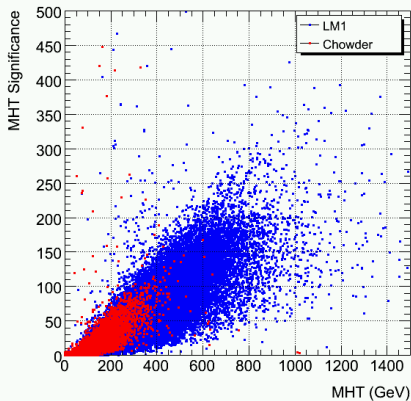


The MET distribution in all-hadronic SUSY searches



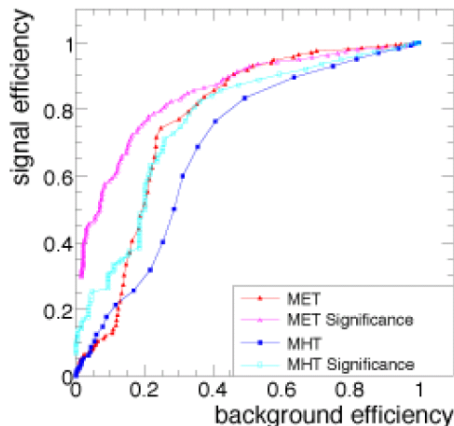
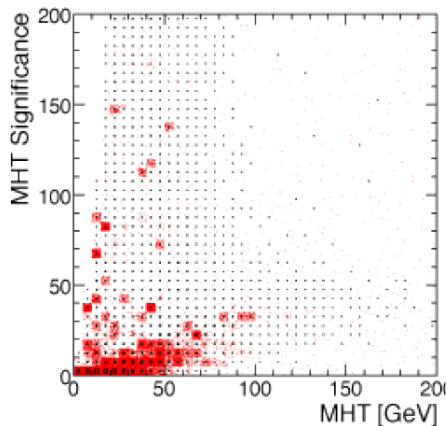
- MET for SUSY and background events with @ 1fb $^{-1}$
- Main cuts:
 - $N_{\text{jets}} \geq 3$
 - $E_T^{j1} > 180$ GeV
 - $E_T^{j2} > 110$ GeV
 - $E_T^{j3} > 30$ GeV
 - lepton veto
- Detail: CMS CR 2007/053

MHT Significance Performance for SUSY



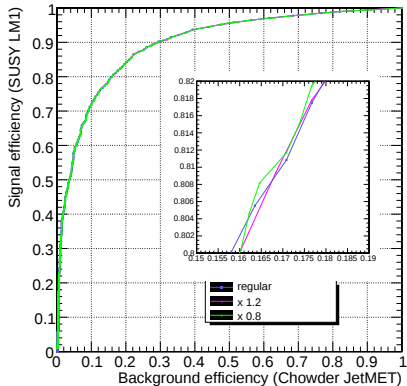
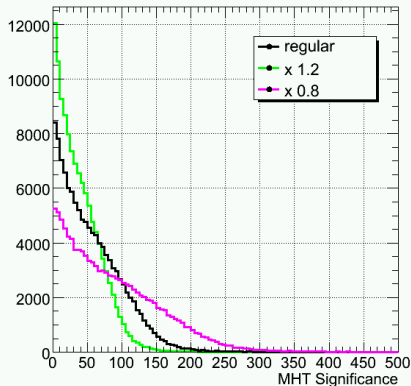
- Not useful for LM1 where MHT is already powerful

MHT Significance Performance for Wenu



- Looks useful for Wenu where MHT is small

Change the resolution of objects $\pm 20\%$



- MHT Significance performance is not sensitive to the resolutions.

Todo

- Final tweak of the resolution functions
- Finish up the CMS Note section
- Upgrade to CMSSW 2XX