

First steps with SHERPA

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Overview

- Installation
- Configuration
- Production
- Analysis
- Introducing new models

Production

sherpa – reading data files in eg. LHC directory
for the specific process (ttbar, WBF)
makelib – creation of the process libraries
sherpa_run – adapting to the phase space
sherpa_run – creating events

Sample process:

```
Process : 93 93 -> 6[a] -6[b] 93{1}  
Order electroweak : 0  
Decay : 6[a] -> -11 12 5  
Decay : -6[b] -> 13 -14 -5  
Max_epsilon : 1e-4  
End process
```

Analysis

Top pair production with decay:

$$tt \rightarrow e \nu_e \mu \nu_\mu bb + 0,1\text{jets}$$

Higgs production in WBF and decay:

$$h \rightarrow e \nu_e \mu \nu_\mu$$

Important background contribution

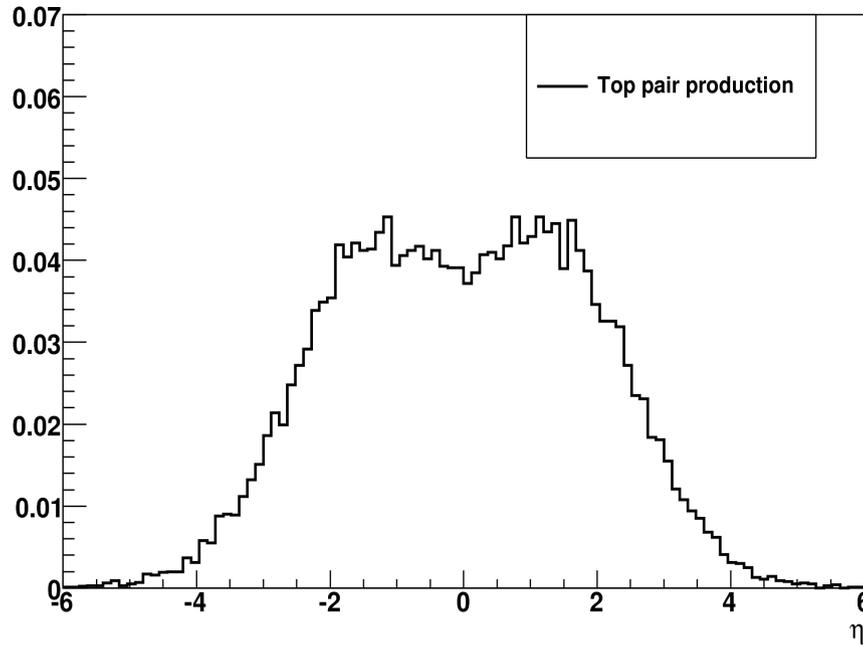
Important parameters:

CKKW matching parameter $p_{T0} = 40\text{GeV}$ –
threshold between ME and Shower

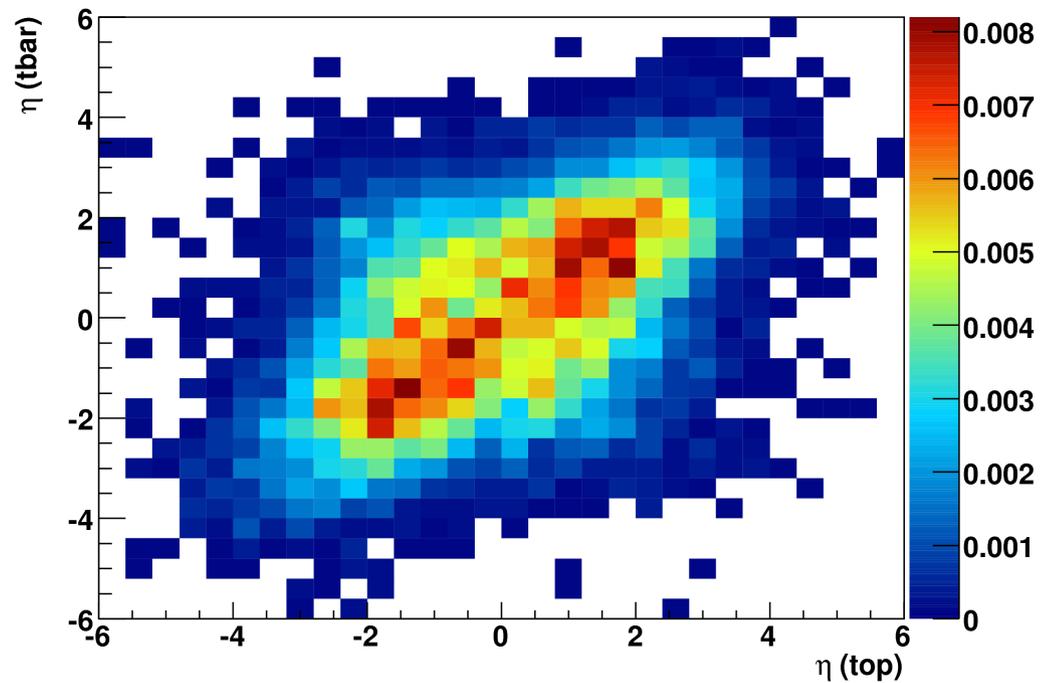
$m_h = 120\text{ GeV}$

Top pair observables

$\eta(\text{top}), \eta(\text{tbar})$

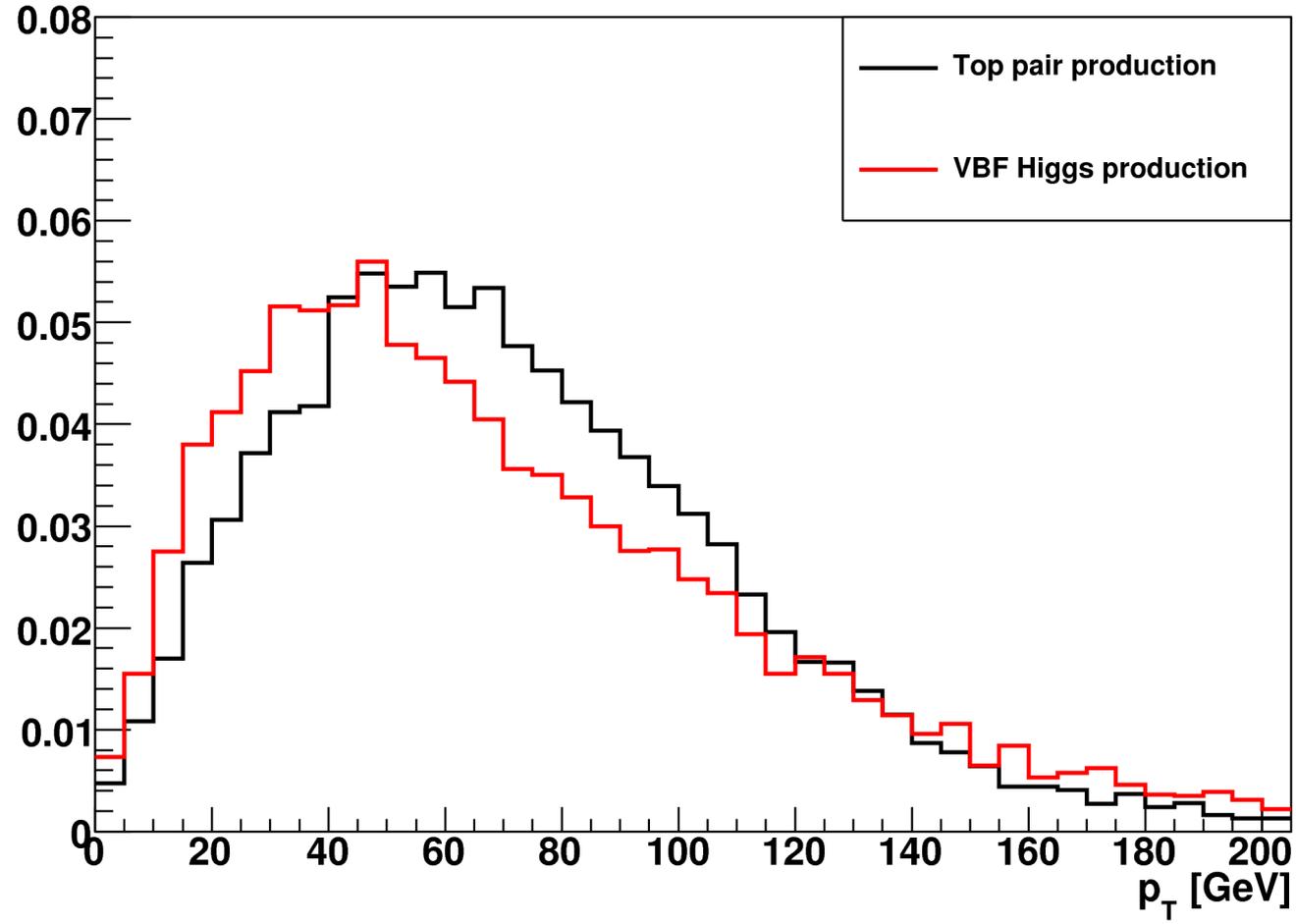


$\eta(\text{top})$ vs. $\eta(\text{tbar})$

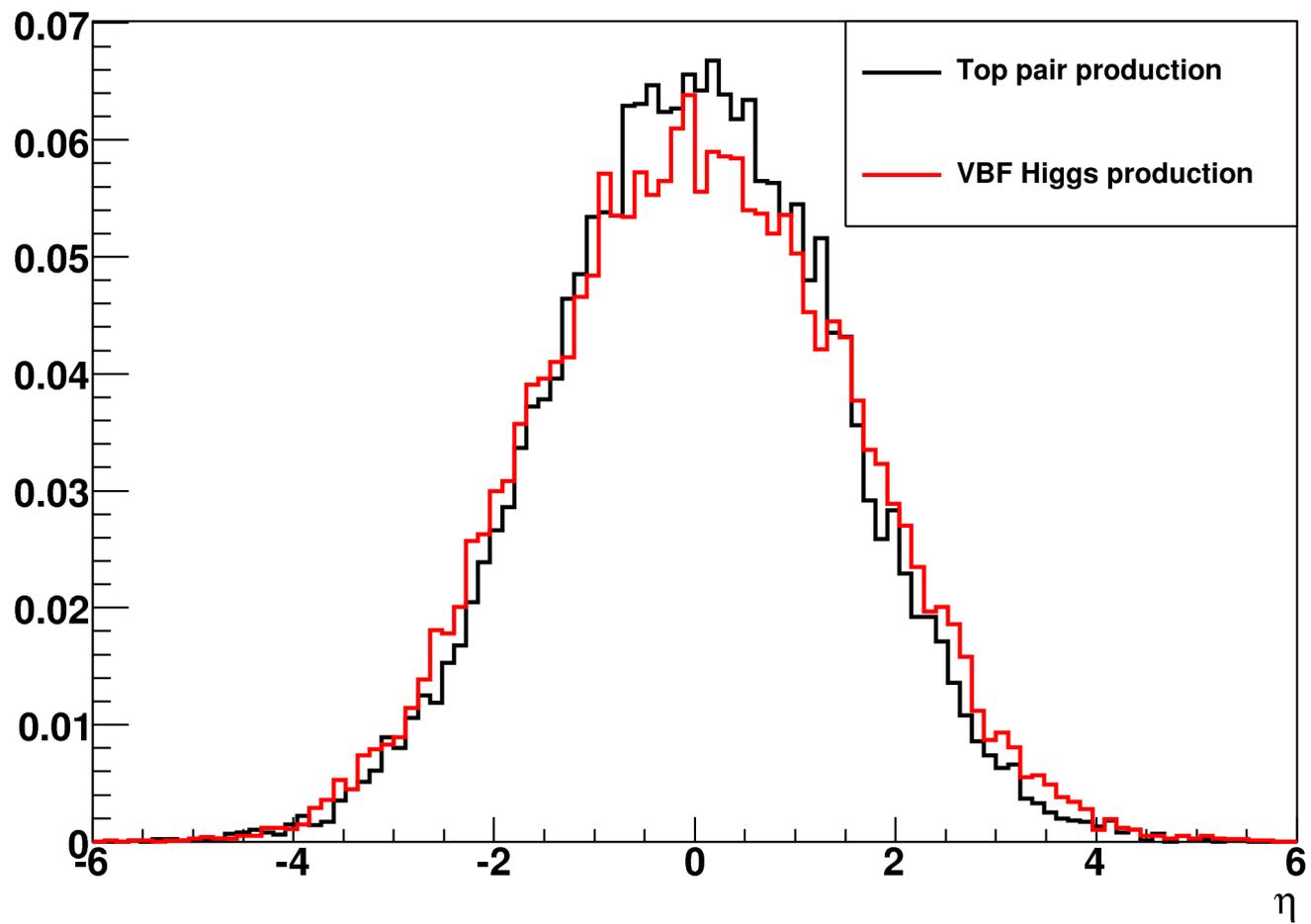


Comparison will follow

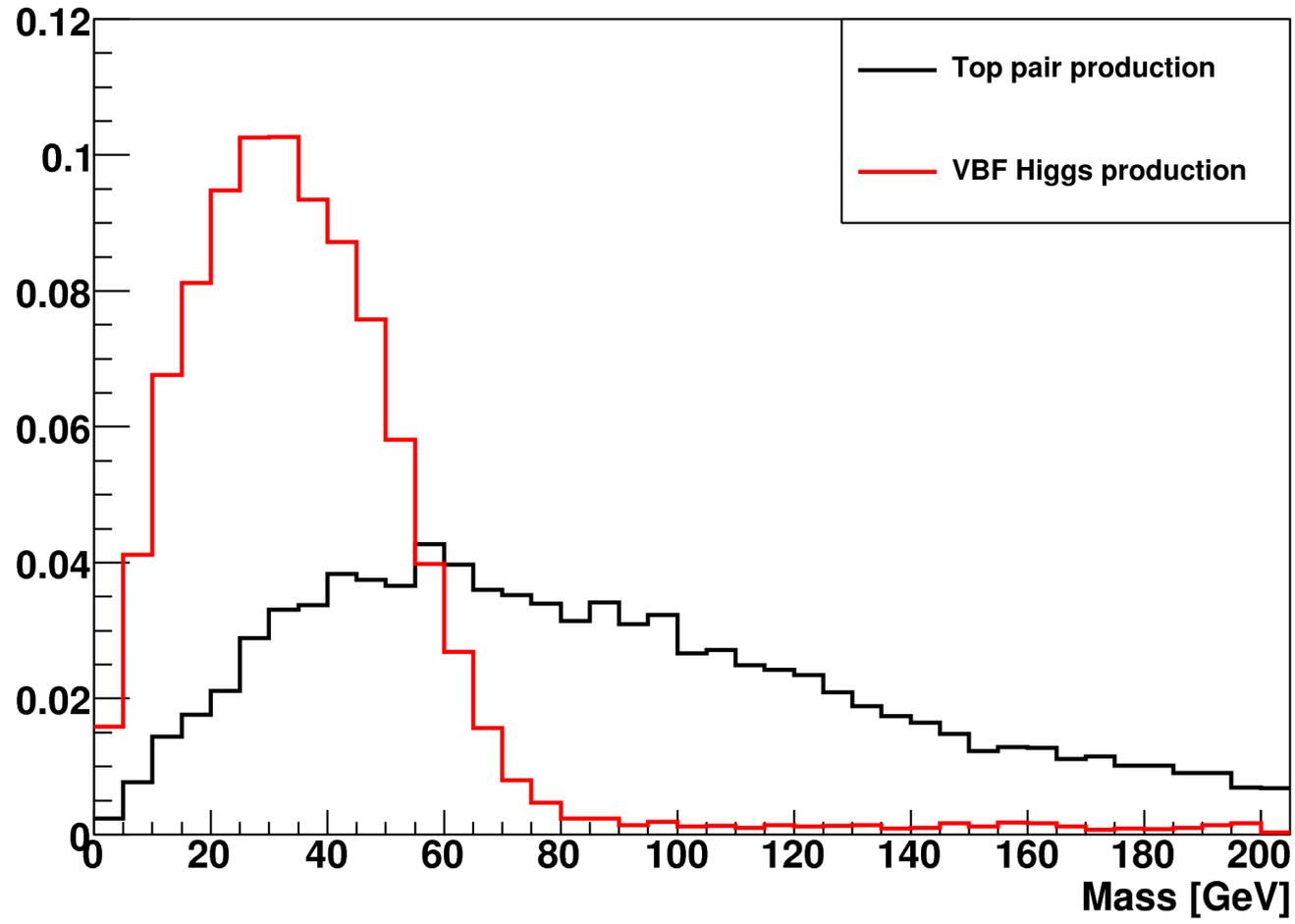
p_T of the full final state



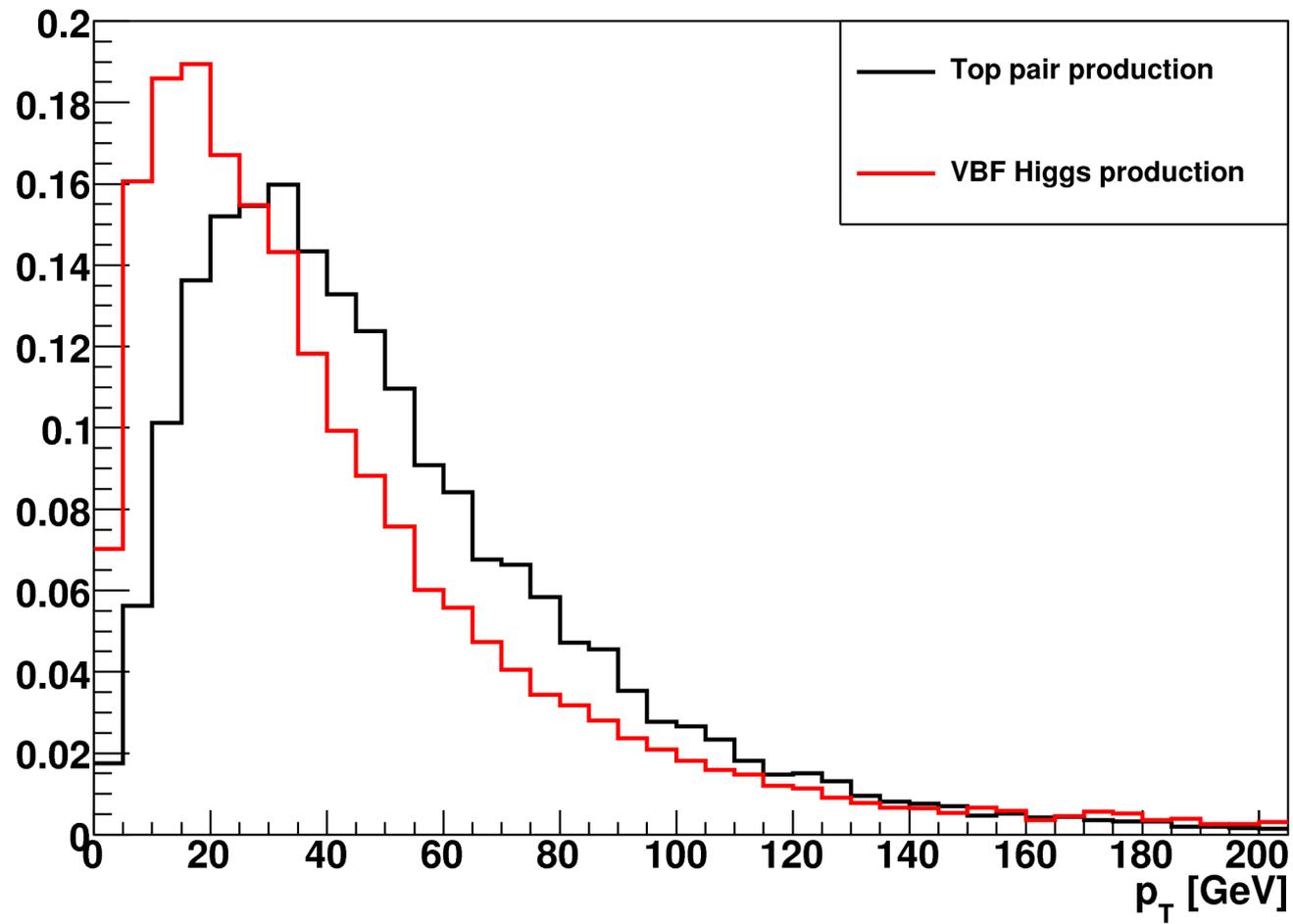
Lepton η



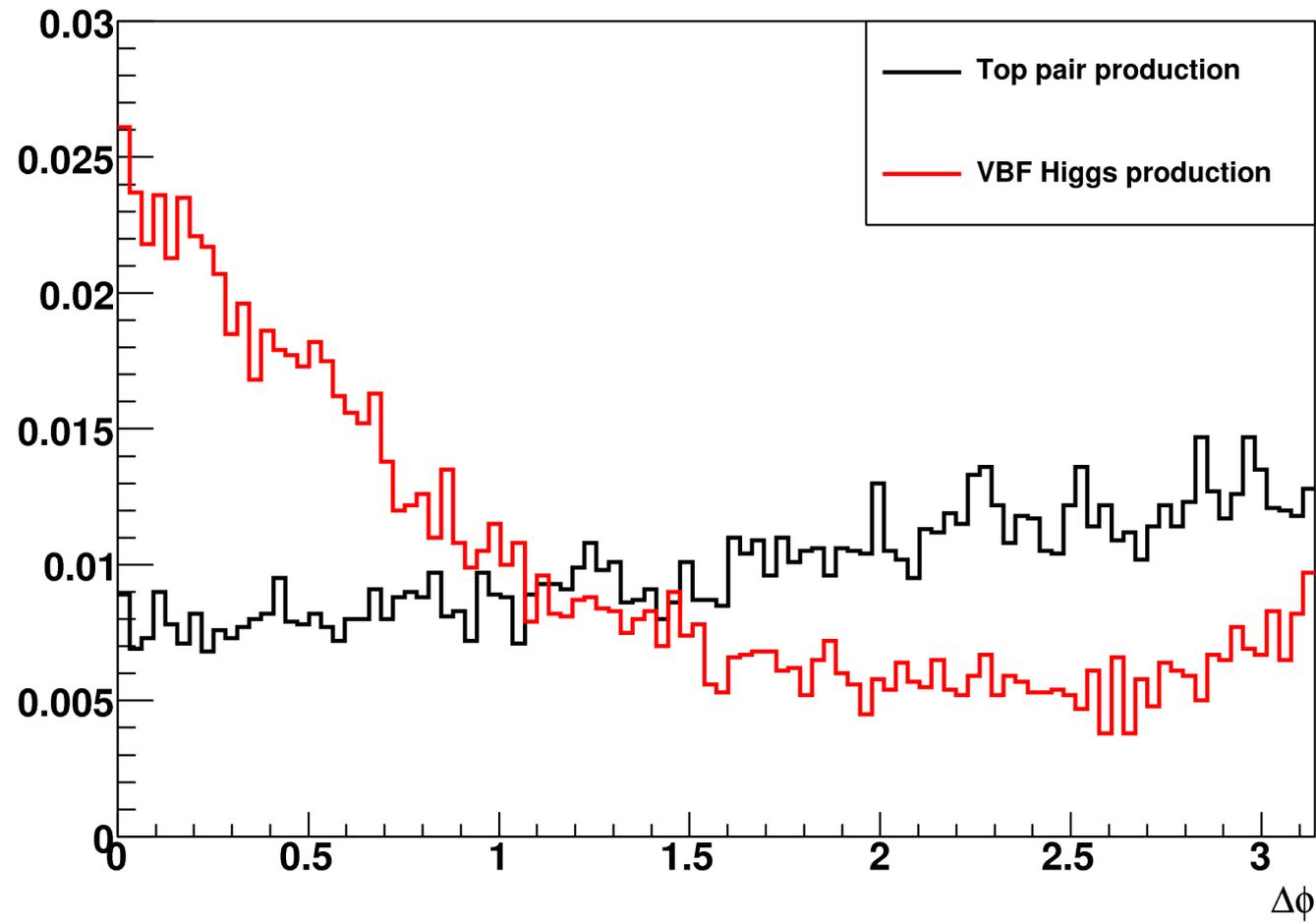
Lepton pair mass



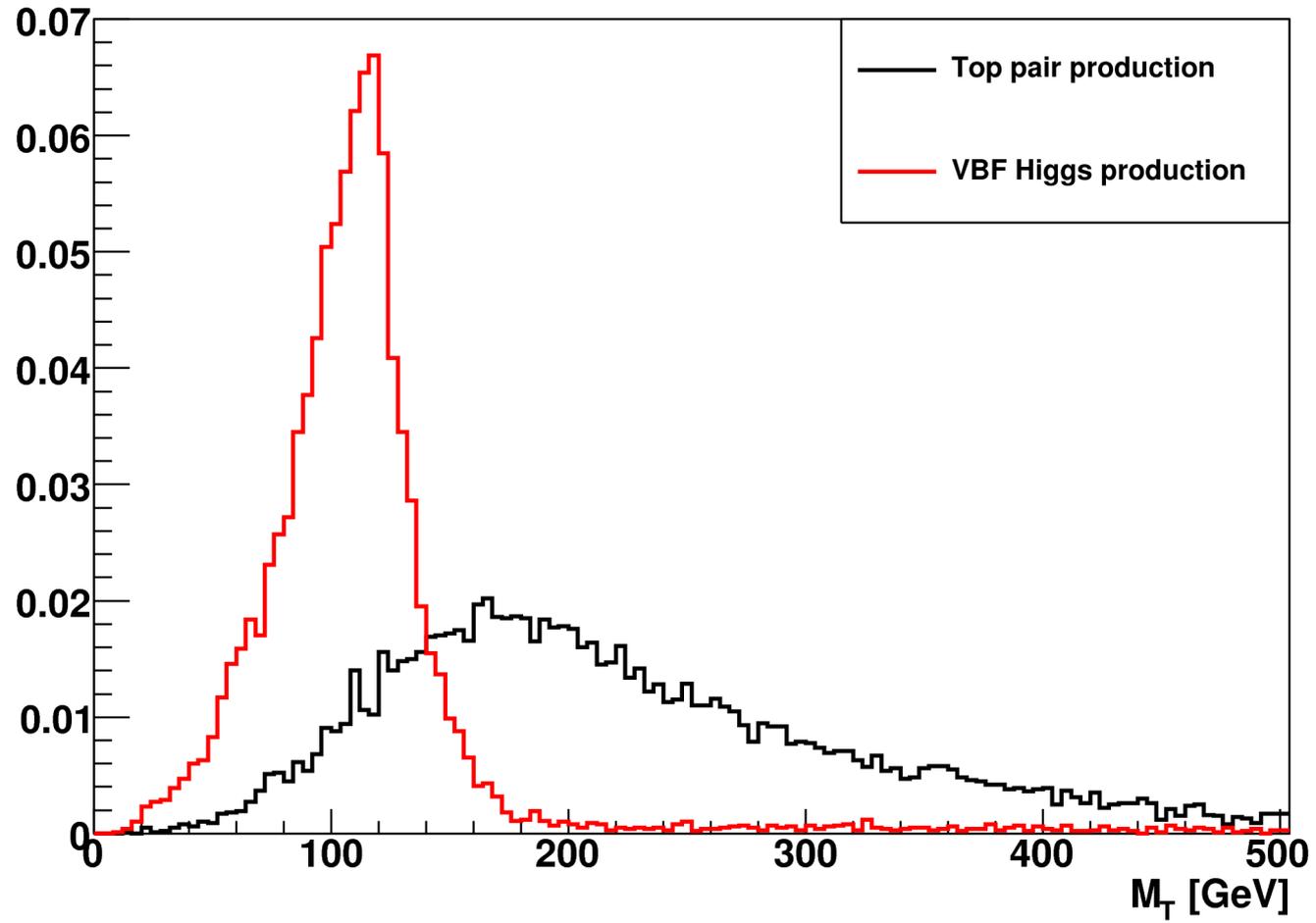
Lepton p_T



$\Delta\phi$ between leptons



Transverse mass



Charged particle multiplicity

