

Measurement of the Top Quark Mass in the $t\bar{t} \rightarrow \text{lepton} + \text{jets}$ channel from $\sqrt{s} = 13\text{TeV}$ ATLAS data

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Why Measuring the Top-Quark mass?

How the Data is taken?

How is the Top-Quark mass measured?

Measurement is based on a 3D-Template method:

- Variable 1: m_{top}^{reco} from reconstructed Events
- Variable 2: m_W^{reco} from chosen jet permutation, sensitive to JSF
- Variable 2: R_{bq}^{reco} from chosen jet permutation, sensitive to bJSF

$$R_{bq}^{reco,1b} = \frac{p_T^{btag}}{(p_T^{W_{jet1}} + p_T^{W_{jet2}})/2}$$

$$R_{bq}^{reco,2b} = \frac{p_T^{bhad} + p_T^{blep}}{p_T^{W_{jet1}} + p_T^{W_{jet2}}}$$

Determination of m_{top} :

- Need fully reconstruction of $t\bar{t}$ -finale state
- Template parametrisation of the 3 variables
- Unbinned likelihood fit is performed

Objectdefinition

Pre-selection

- At least one good primary vertex with five associated tracks
- Exactly one isolated high p_T lepton
- At least 4 central jets with high p_T
- 1 or 2 b-tagged jets
- Cuts on E_T^{miss} , m_T^W or $E_T^{miss} + m_T^W$
- W+jets normalization and HF fraction estimated from data
- Multijet background obtained from data in control region

Event yields after preselection

Data/MC agreement

Status 13TeV

Event reconstruction

Reconstrucion with KLFitter

Data/MC agreement KLFitter

Template parametrisation

Workflow for Optimization studies

In the following

Previous results

Summary Conclusion