

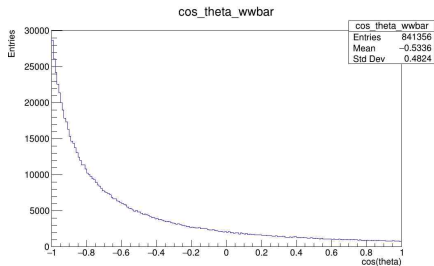
Spin Correlations of $t\bar{t}$ and hh Decays

Melina Mrkaljevic

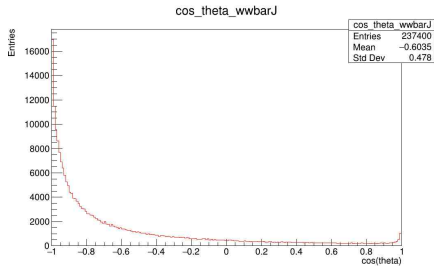
Analysis Meeting

25. June 2024

$t\bar{t}$: W^+W^- Spin Correlation

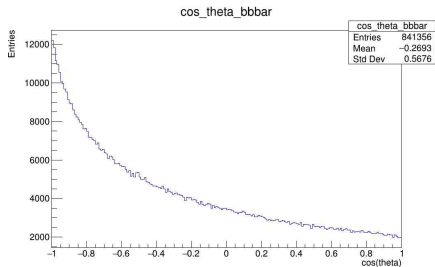


$\cos(\theta_{EK})$ for W^+W^- via Particle List

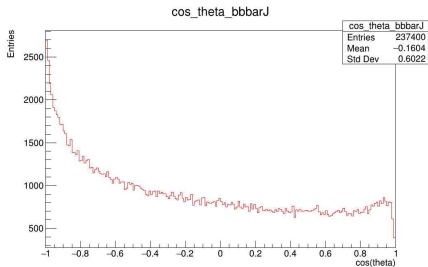


$\cos(\theta_{EK})$ for W^+W^- via Jet Reconstruction

$t\bar{t}$: $\bar{b}b$ Spin Correlation

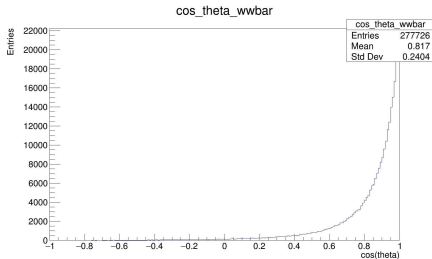


$\cos(\theta_{EK})$ for $\bar{b}b$ via Particle List

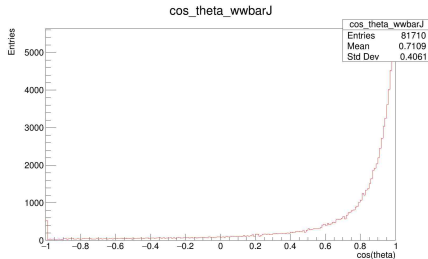


$\cos(\theta_{EK})$ for $\bar{b}b$ via Jet Reconstruction

hh: W^+W^- Spin Correlation

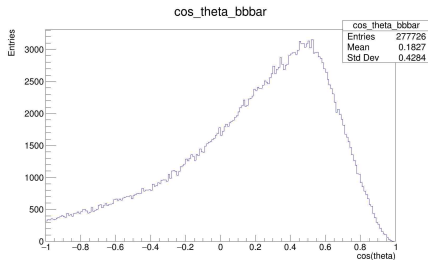


$\cos(\theta_{EK})$ for W^+W^- via Particle List

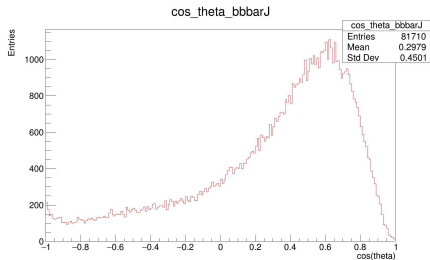


$\cos(\theta_{EK})$ for W^+W^- via Jet Reconstruction

hh: $\bar{b}b$ Spin Correlation



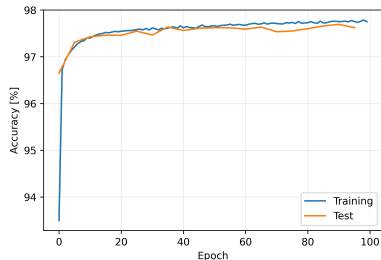
$\cos(\theta_{EK})$ for $\bar{b}b$ via Particle List



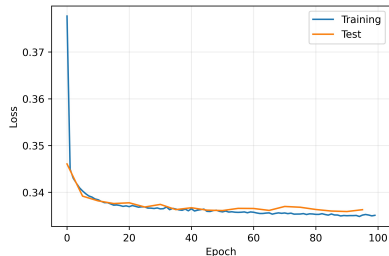
$\cos(\theta_{EK})$ for $\bar{b}b$ via Jet Reconstruction

Neural Network

- Variables: $\text{Cos}(\theta)_{w\bar{w}}$, $\text{Cos}(\theta)_{b\bar{b}}$, $W_{had}Mass$, $W_{lep}Mass$, $Jet1pT$, $Jet2pT$, $Jet3pT$, $Jet4pT$, $\Delta R_{w\bar{w}}$, $\Delta R_{b\bar{b}}$
- Structure: 2 hidden layers with 10 nodes each, 81000 events



Training and Test Accuracy



Training and Test Loss