



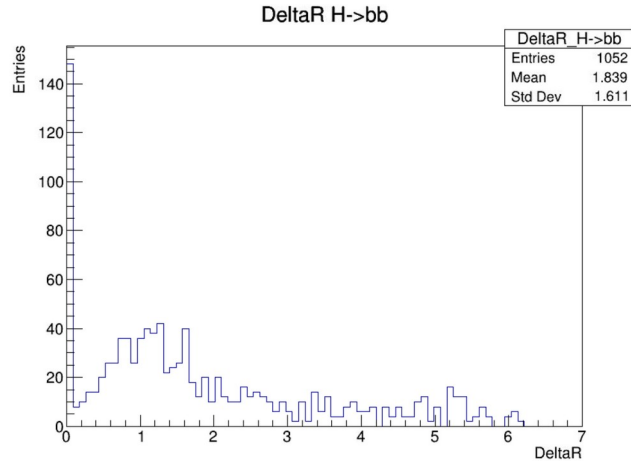
# **Bao Tai Le**

Masterthesis update

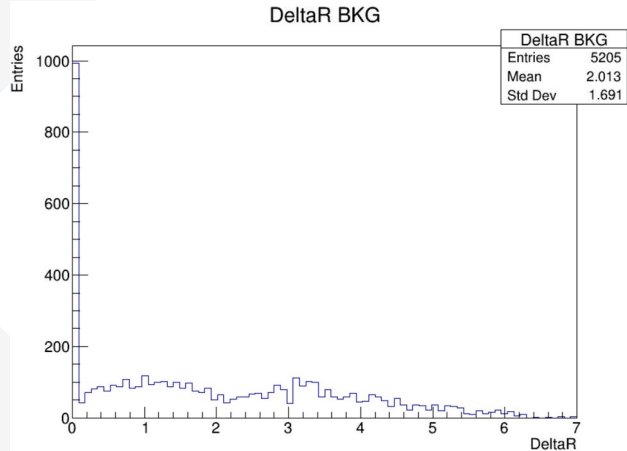
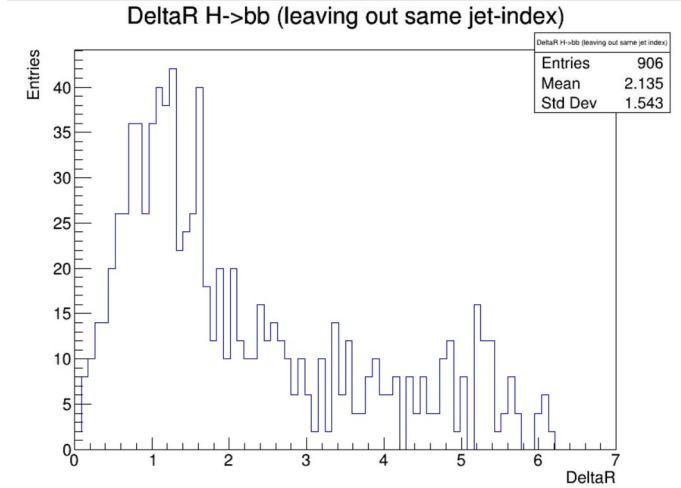
SoSe 2024  
23.7.2024

**So how did my  
last week look  
like?**

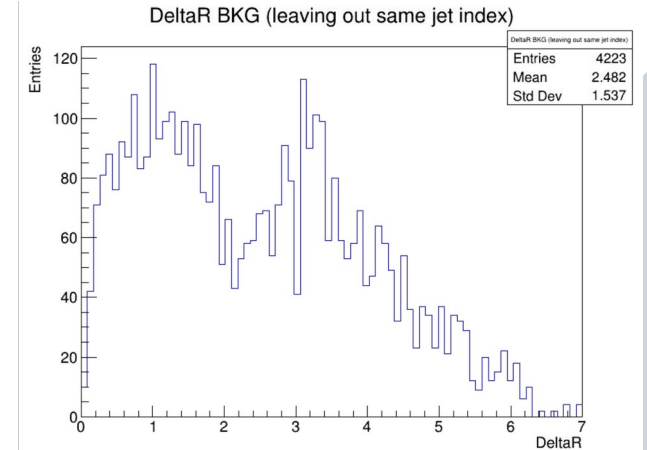
# Angular Difference



Loss of ~10%



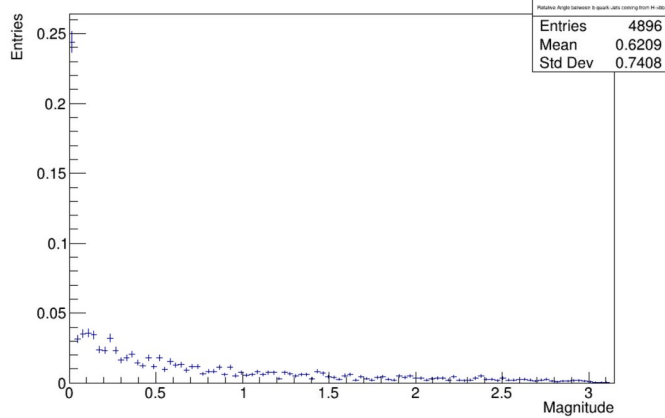
Loss of ~19%



$$\Delta R = \sqrt{(\phi_1 - \phi_2)^2 + (\eta_1 - \eta_2)^2}$$

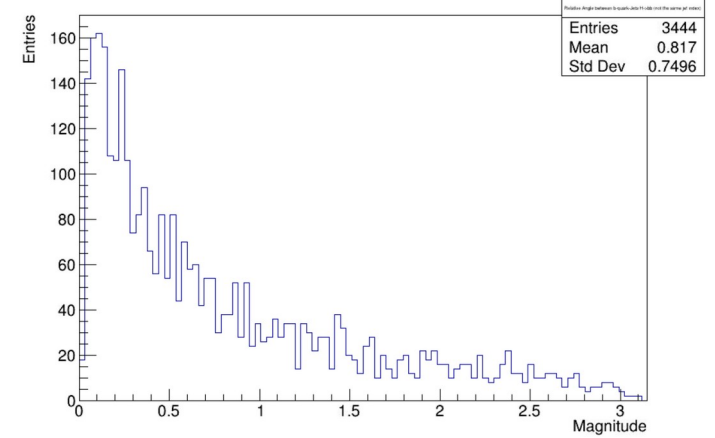
# Angle between jets

Angular Difference between Jets H->bb

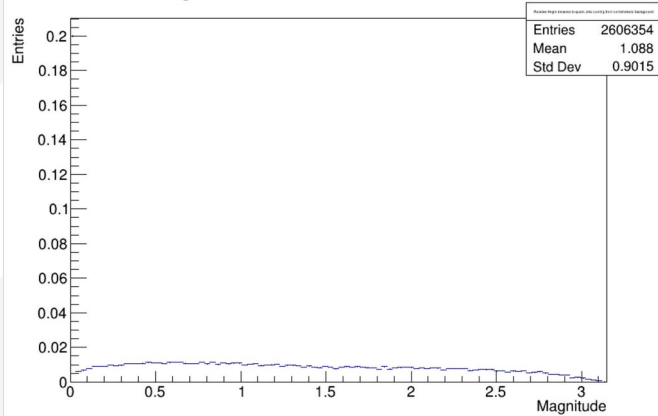


Loss of ~30%

Angular Difference between Jets H->bb nsji



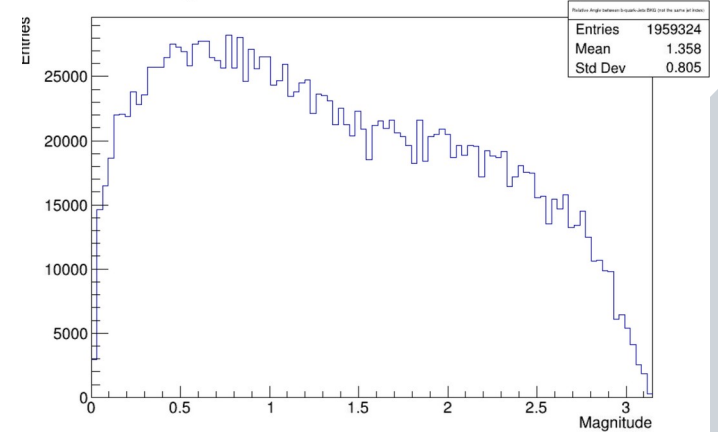
Angular Difference between Jets BKG



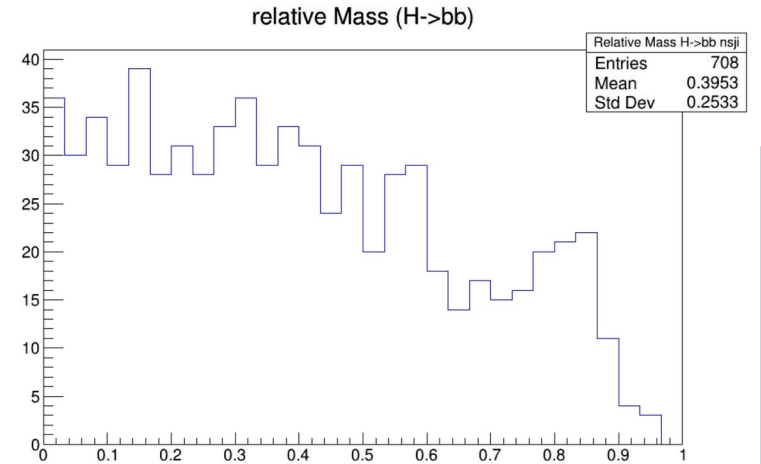
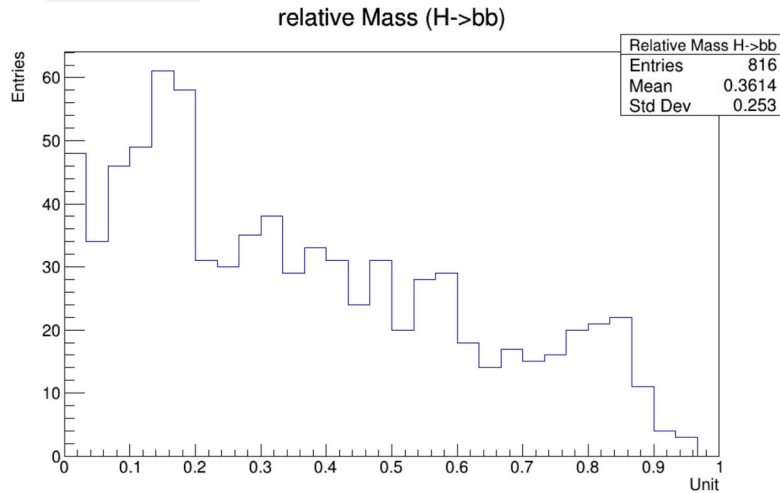
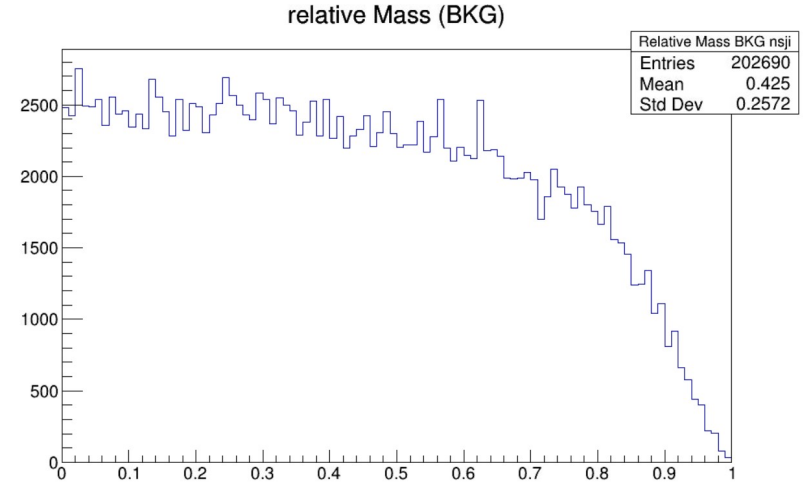
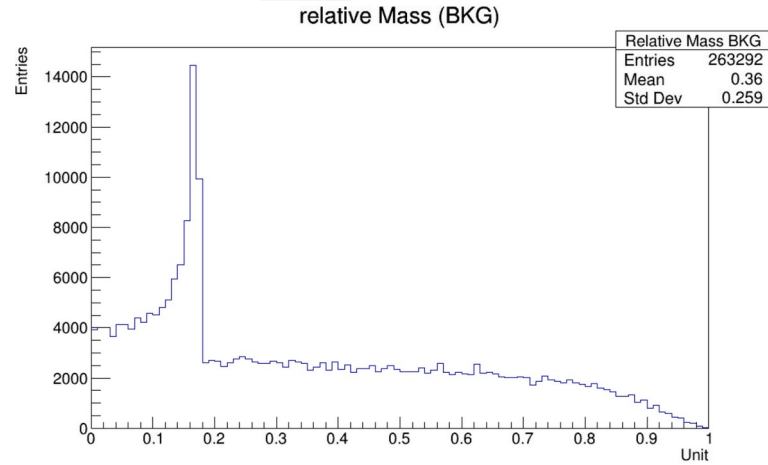
Loss of ~25%

$$\theta = \arccos \left( \frac{j_1 \cdot j_2}{|j_1||j_2|} \right)$$

Angular Difference between Jets BKG nsji



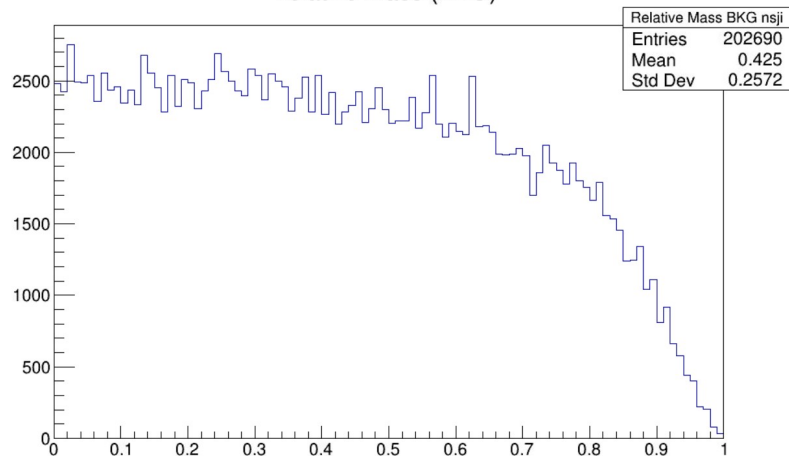
# Relative Mass



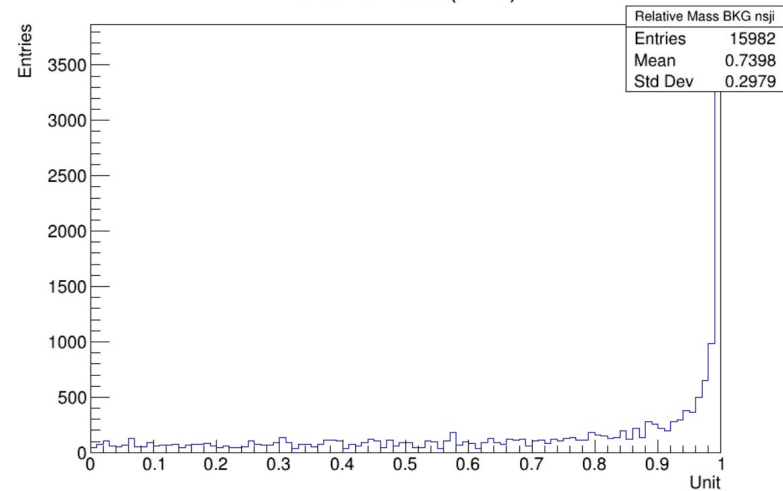
$$m_{rel} = \frac{|m_1 - m_2|}{m_1 + m_2}$$

# Relative Mass (kt vs antikt)

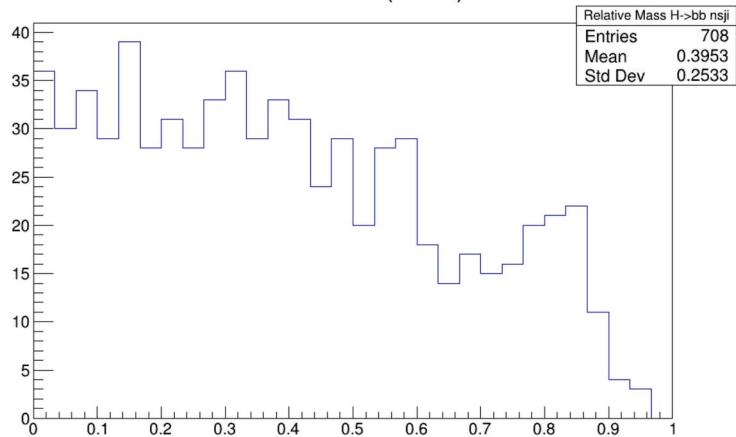
relative Mass (BKG)



relative Mass (BKG)

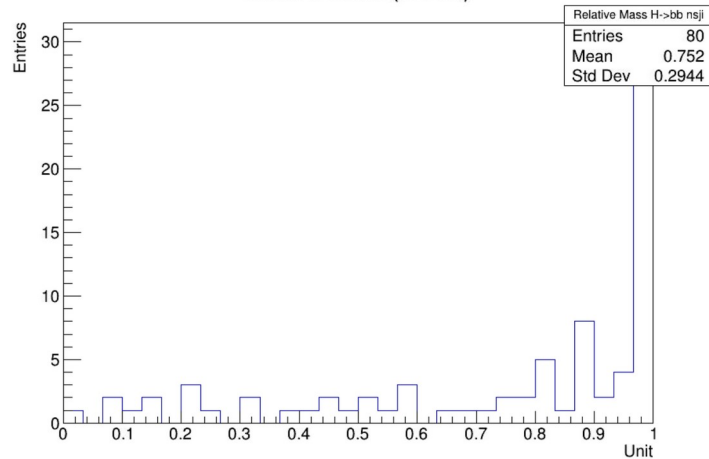


relative Mass (H->bb)

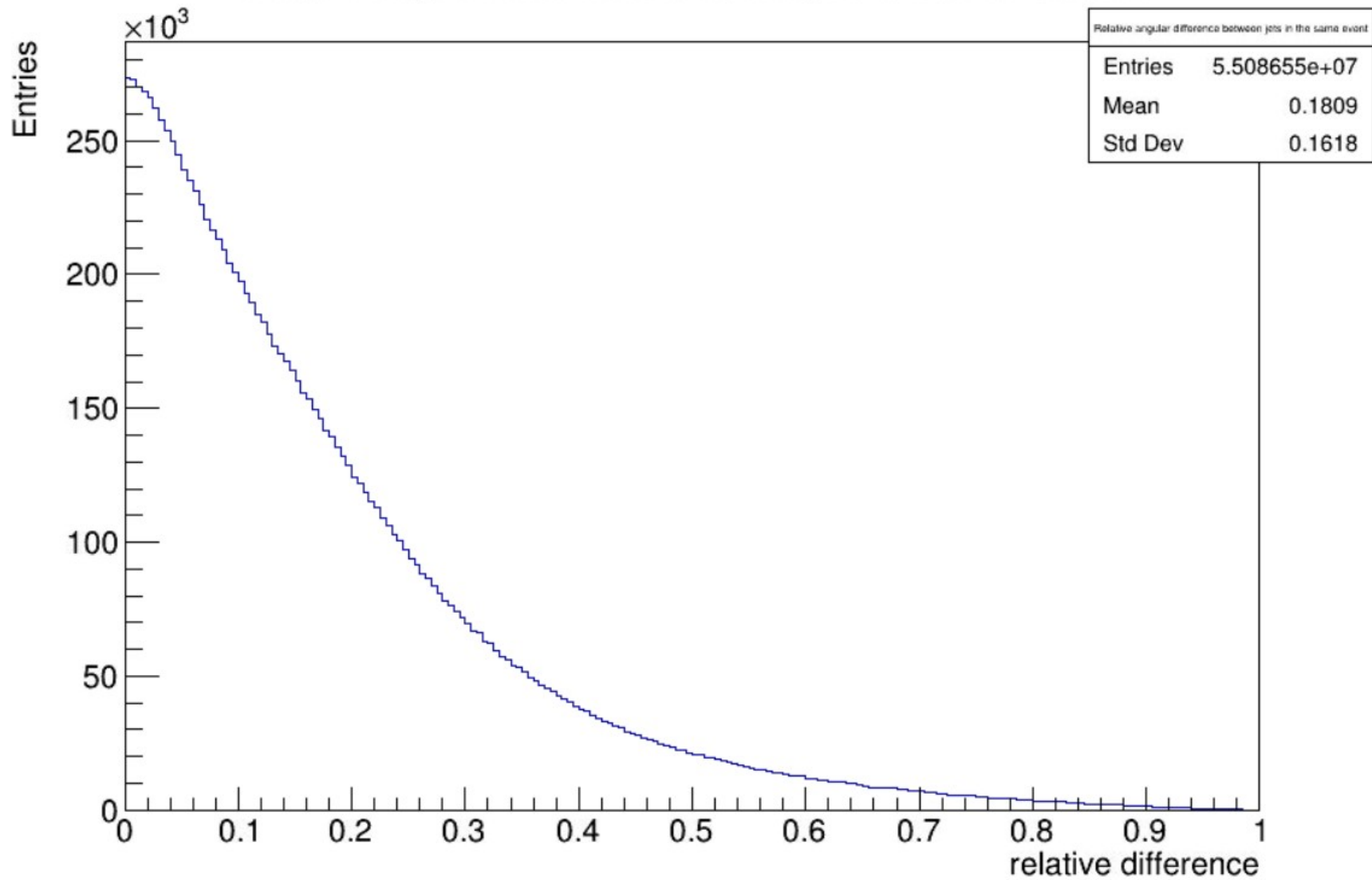


$$m_{rel} = \frac{|m_1 - m_2|}{m_1 + m_2}$$

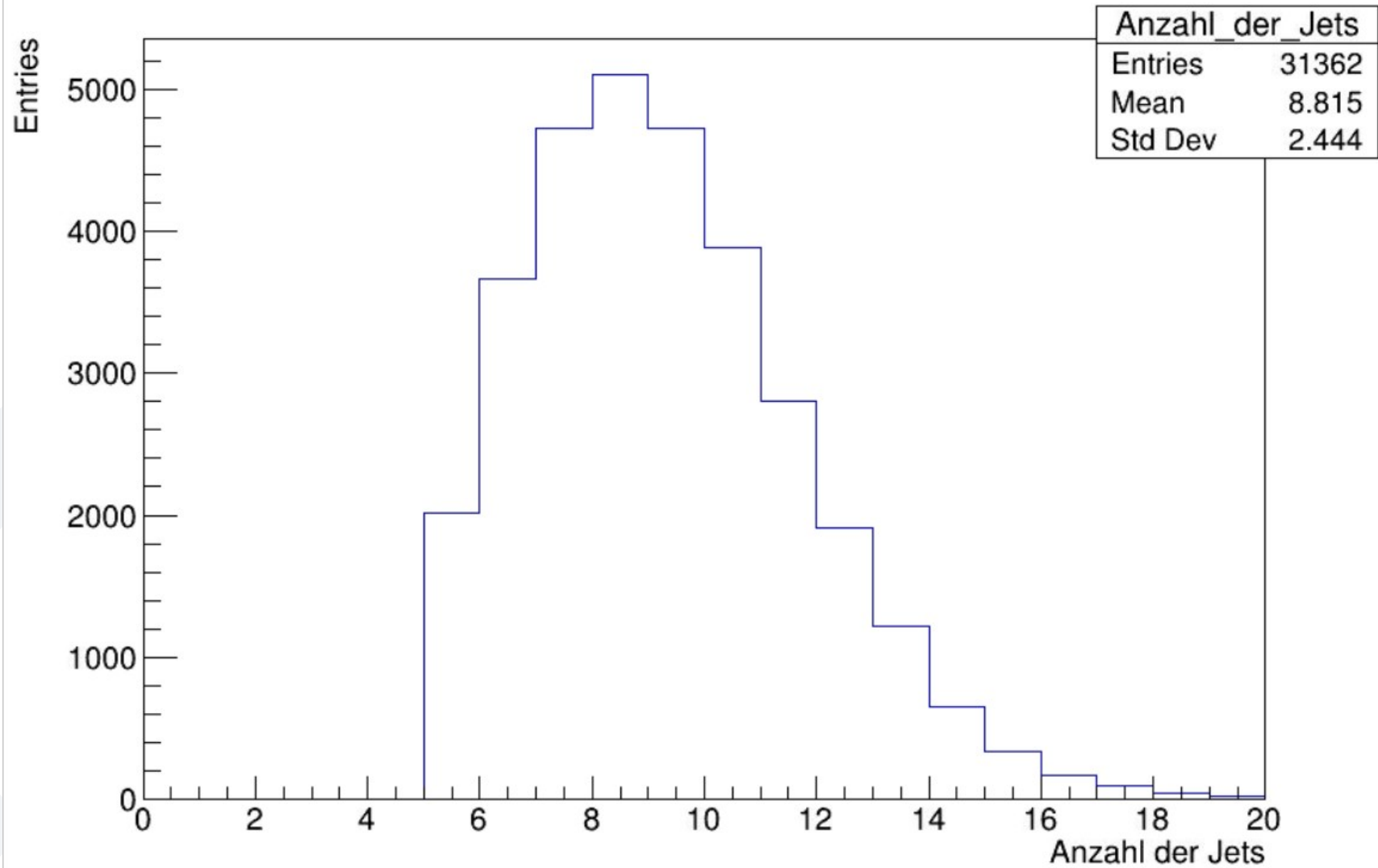
relative Mass (H->bb)



# Relative Angular Difference between jets in the same event



# Anzahl der Jets







The background of the slide features several diagonal stripes in shades of light and medium gray, creating a modern, geometric pattern.

## **Fully Connected networks**

## Resources

- <https://www.curious-cravings.com/images/post/standard-model.png>
- [https://en.wikipedia.org/wiki/Gargamelle#/media/File:Neutral\\_current,\\_leptonic\\_vent,\\_muon\\_neutrino.png](https://en.wikipedia.org/wiki/Gargamelle#/media/File:Neutral_current,_leptonic_vent,_muon_neutrino.png)
- <https://arxiv.org/ftp/arxiv/papers/2310/2310.03073.pdf>
- Discrimination of HH and HZ Final States Using Neural Networks
- <https://cdn3.iconfinder.com/data/icons/data-science-11/64/neural-network-machine-learning-algorithm-1024.png>
- [https://www.researchgate.net/figure/Feynman-diagrams-for-the-leading-Higgs-boson-interactions-Higgs-boson-production-in-a\\_fig1\\_361733458](https://www.researchgate.net/figure/Feynman-diagrams-for-the-leading-Higgs-boson-interactions-Higgs-boson-production-in-a_fig1_361733458)