

Benchmarking with DVMP

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04-02-2024

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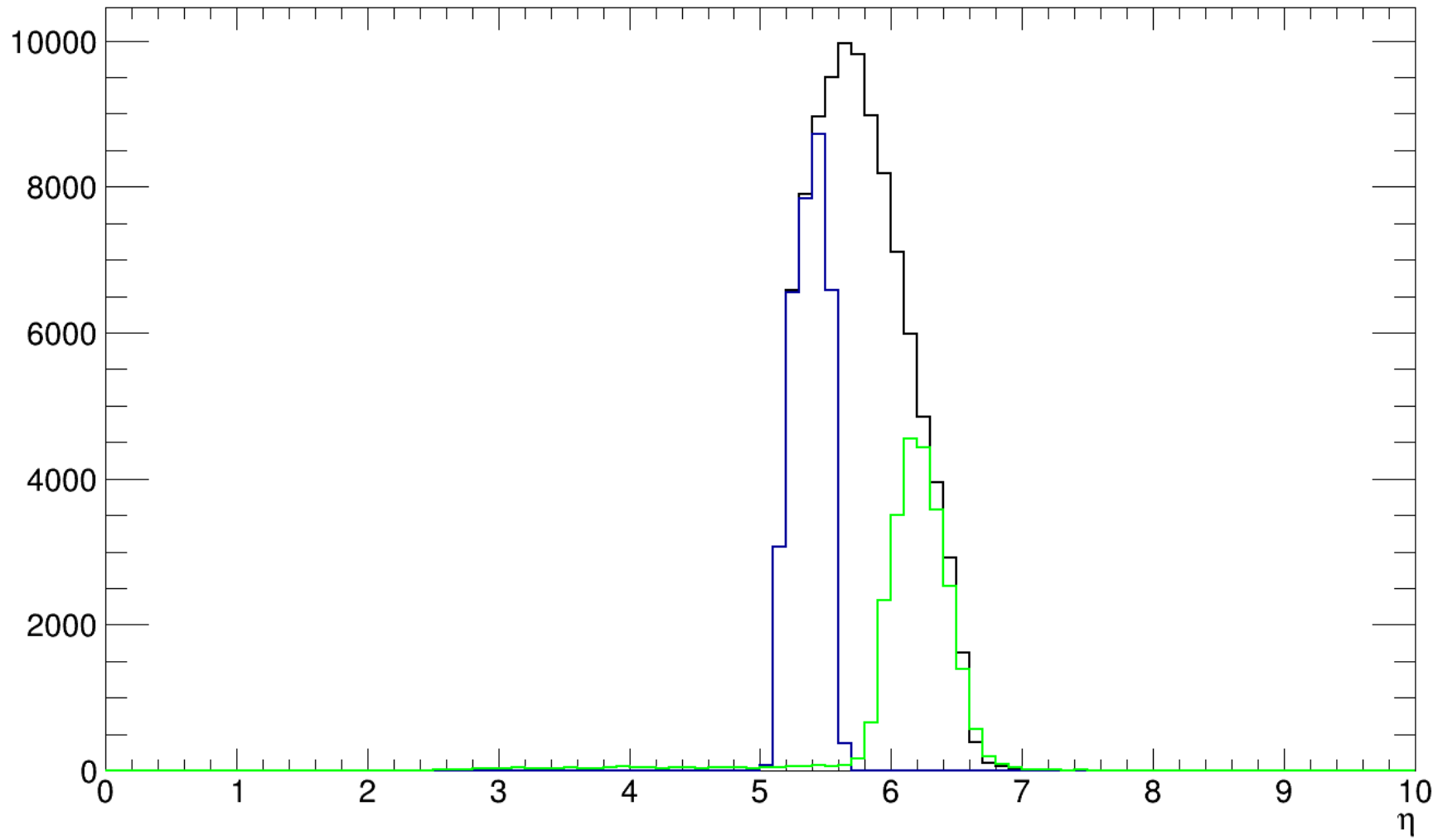
Experiment

- The simulation of $ep \rightarrow e'p'\pi^0$ (10X100) for ePIC is now available.
- It is expected to be updated in the simulation campaign.
- The performance of the B0 spectrometer will be monitored when new simulation files are produced.
- It will also be monitored as a full reaction.

Files

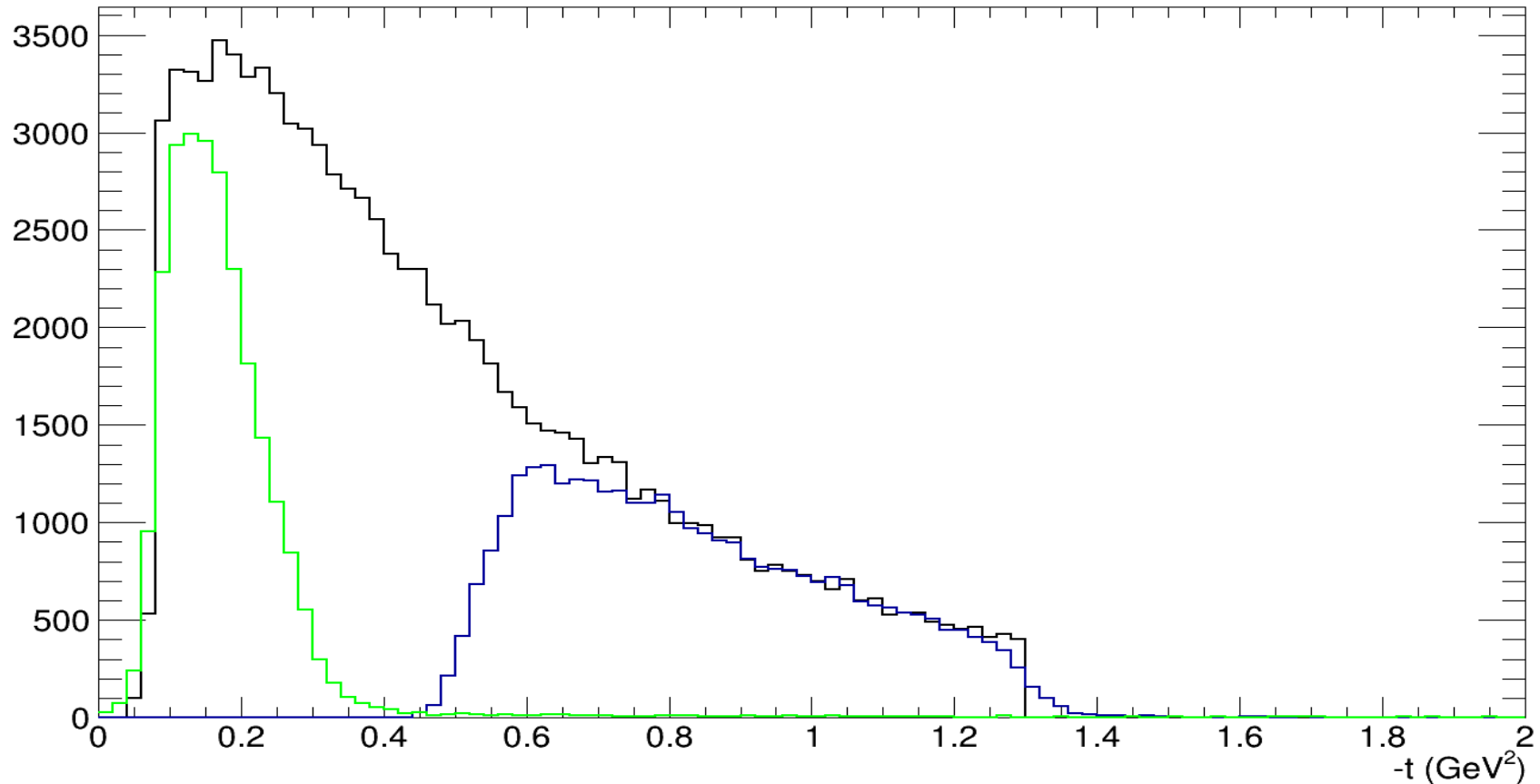
- Current using files from Alex's Dropbox (S3 directory TBD)
The total size is about 1.5Gb.
- Generator files: github.com/eic/DVMPdataset
EPIC generator (used with the Athena Proposal)
- Afterburned with `ip6_hiacc_100x10` setting.
- 100k events have been generated.

Event Coverage



About 33% of the protons are reconstructed by B0 and 26% by roman pots.

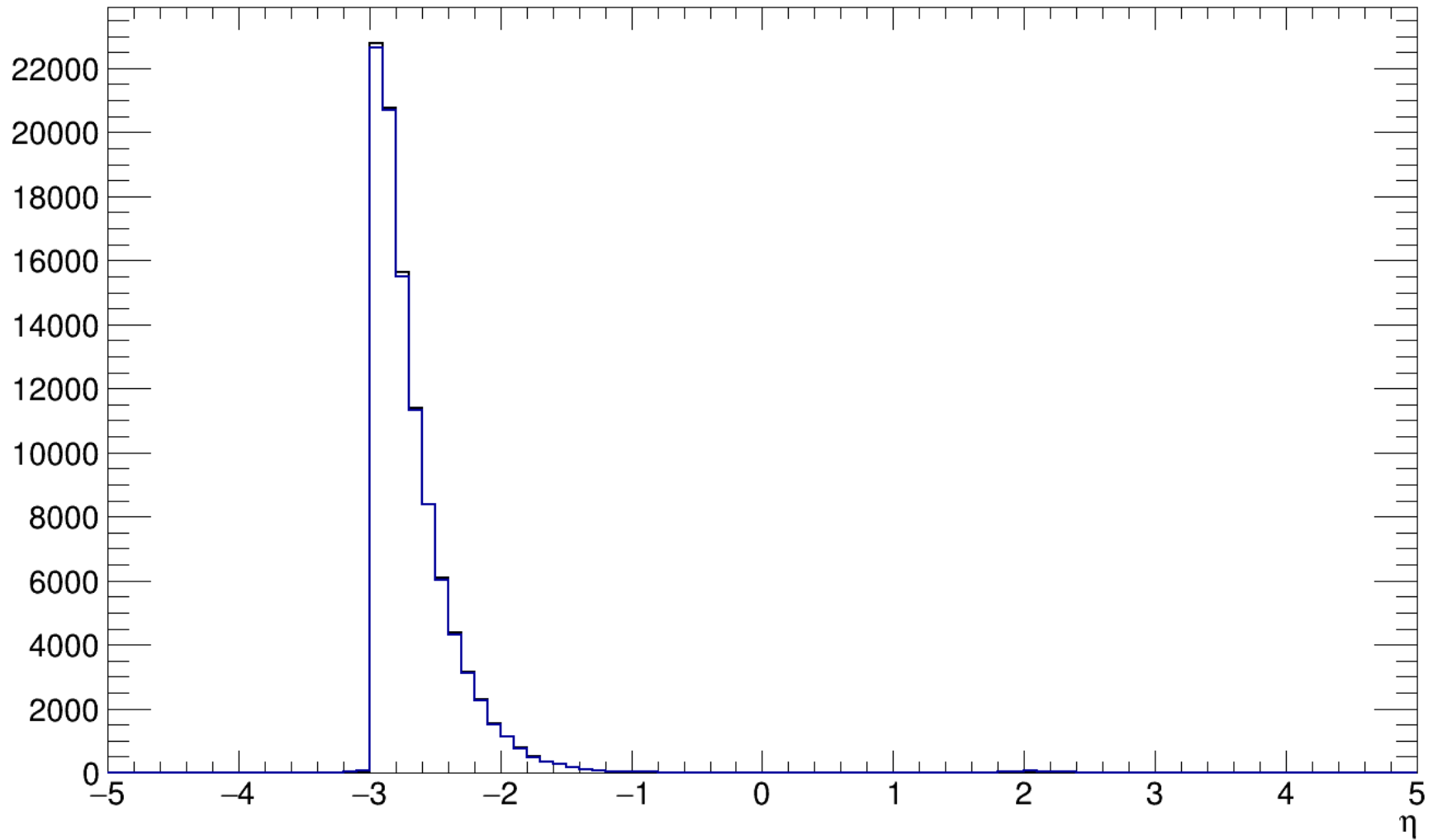
$-t$



The black curve indicates the generated $-t$ distribution while the blue and green curves indicate the reconstructed one.

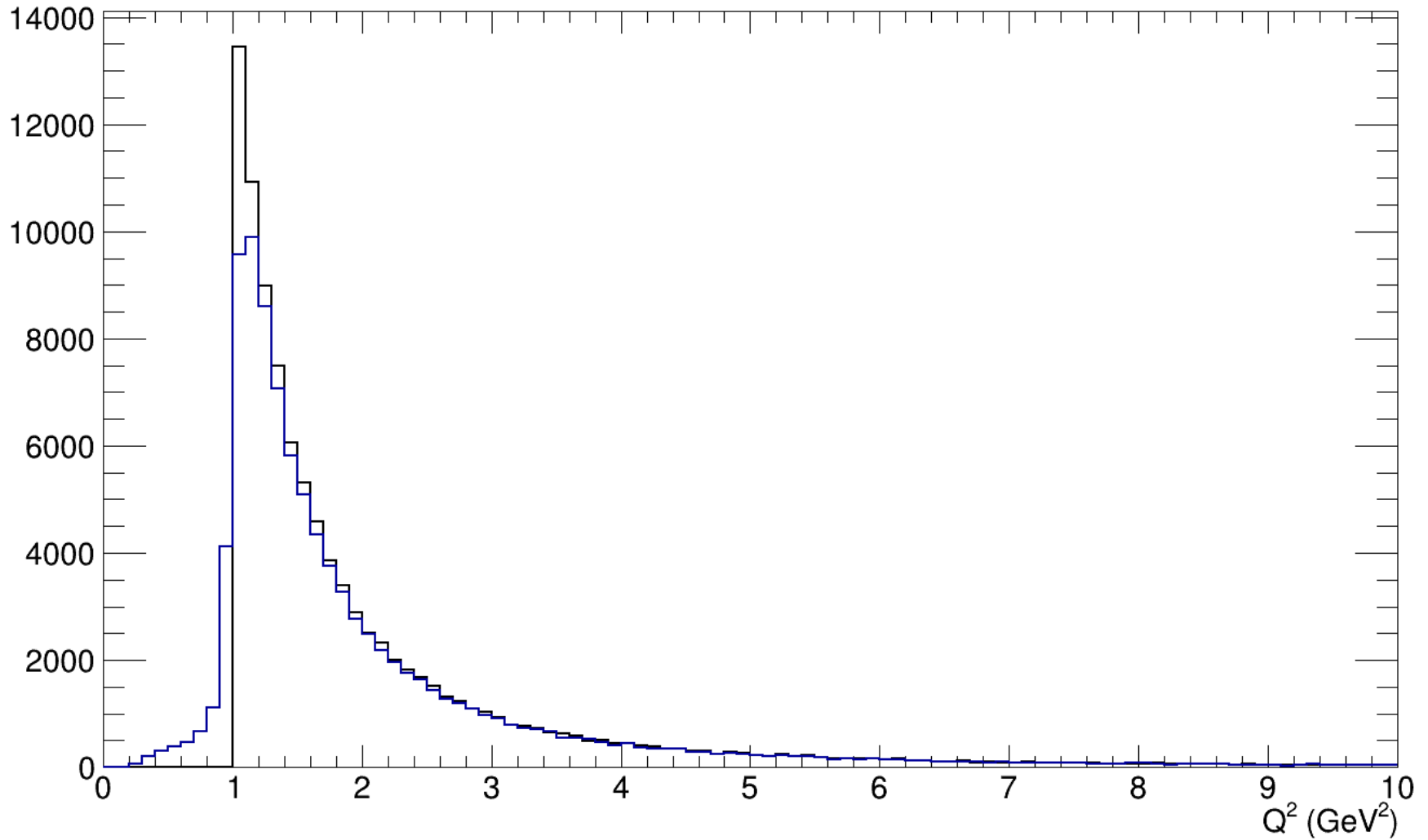
$$t = (p - p')^2$$

Electrons



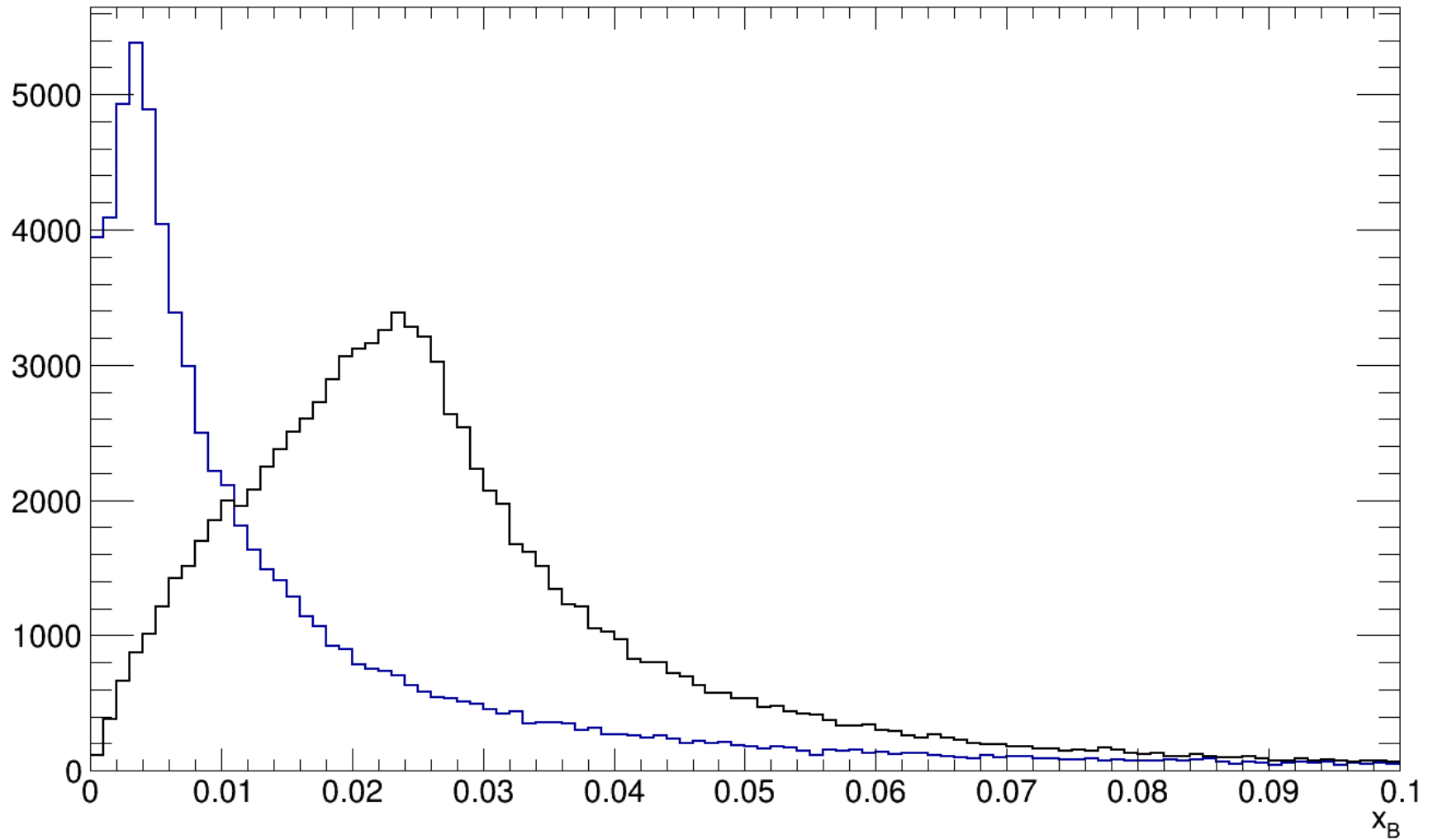
Black: Generated Blue: Reconstructed

Q^2



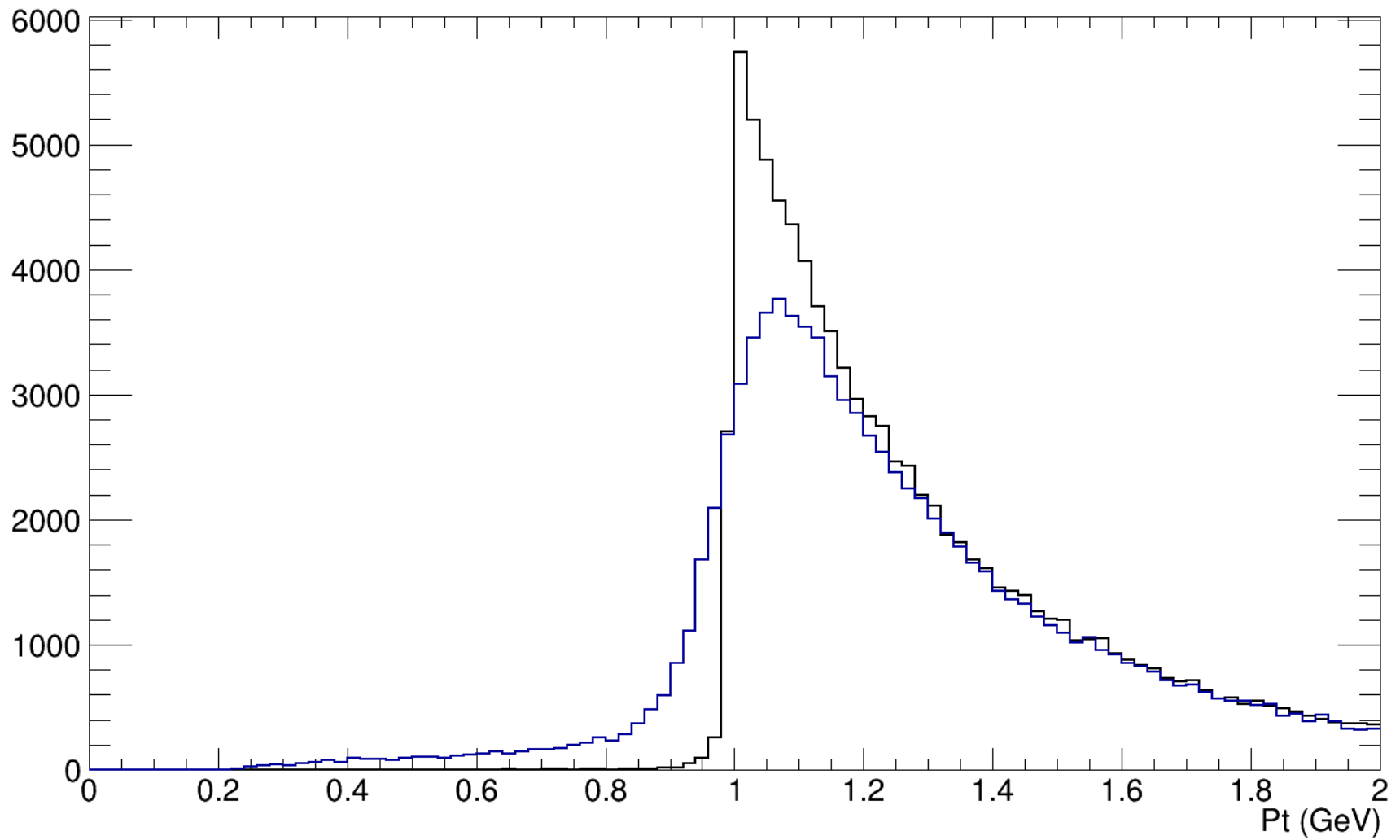
Black: Generated Blue: Reconstructed

$$x_B = Q^2/(2pq)$$

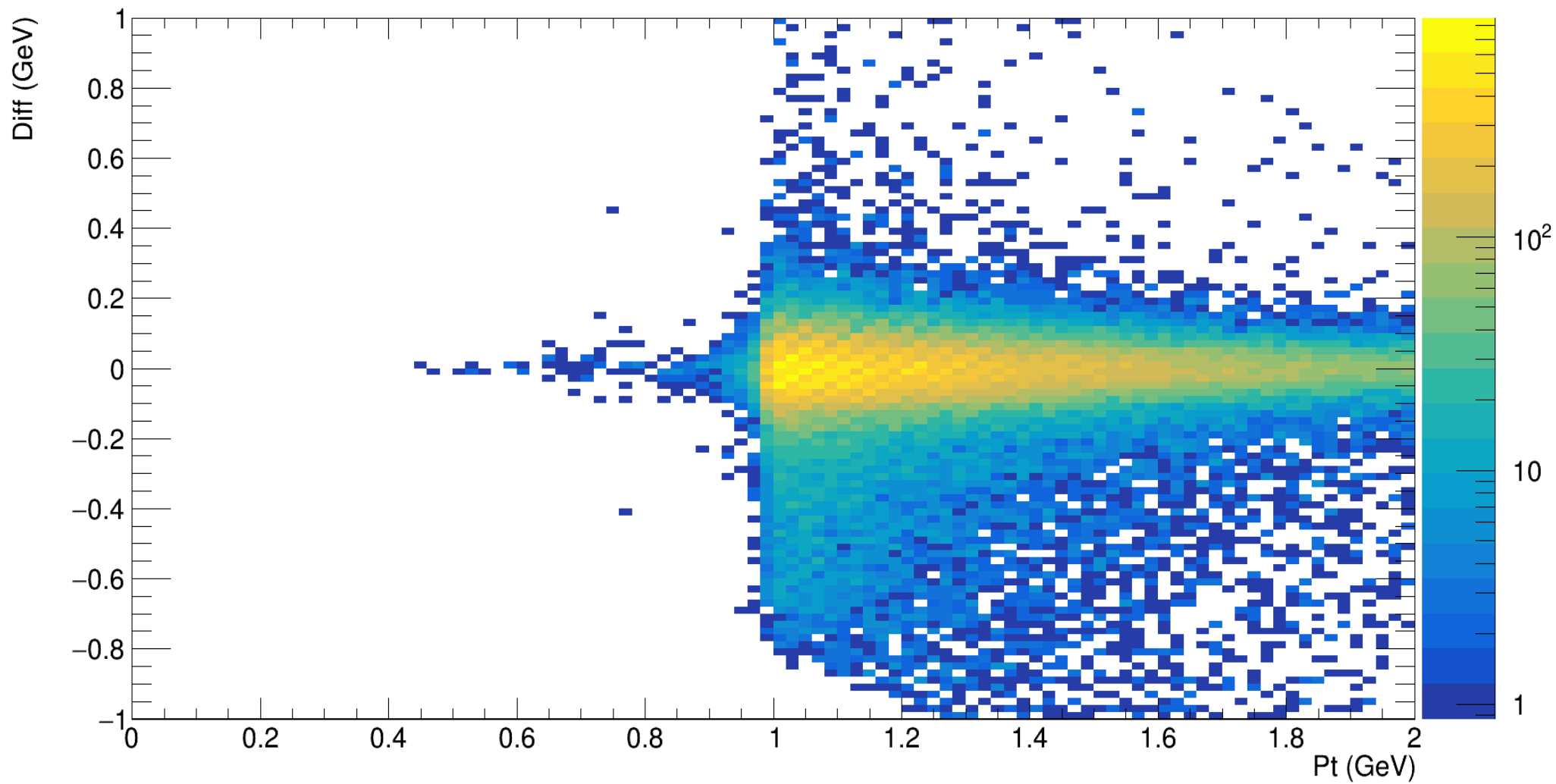


Black: Generated Blue: Reconstructed

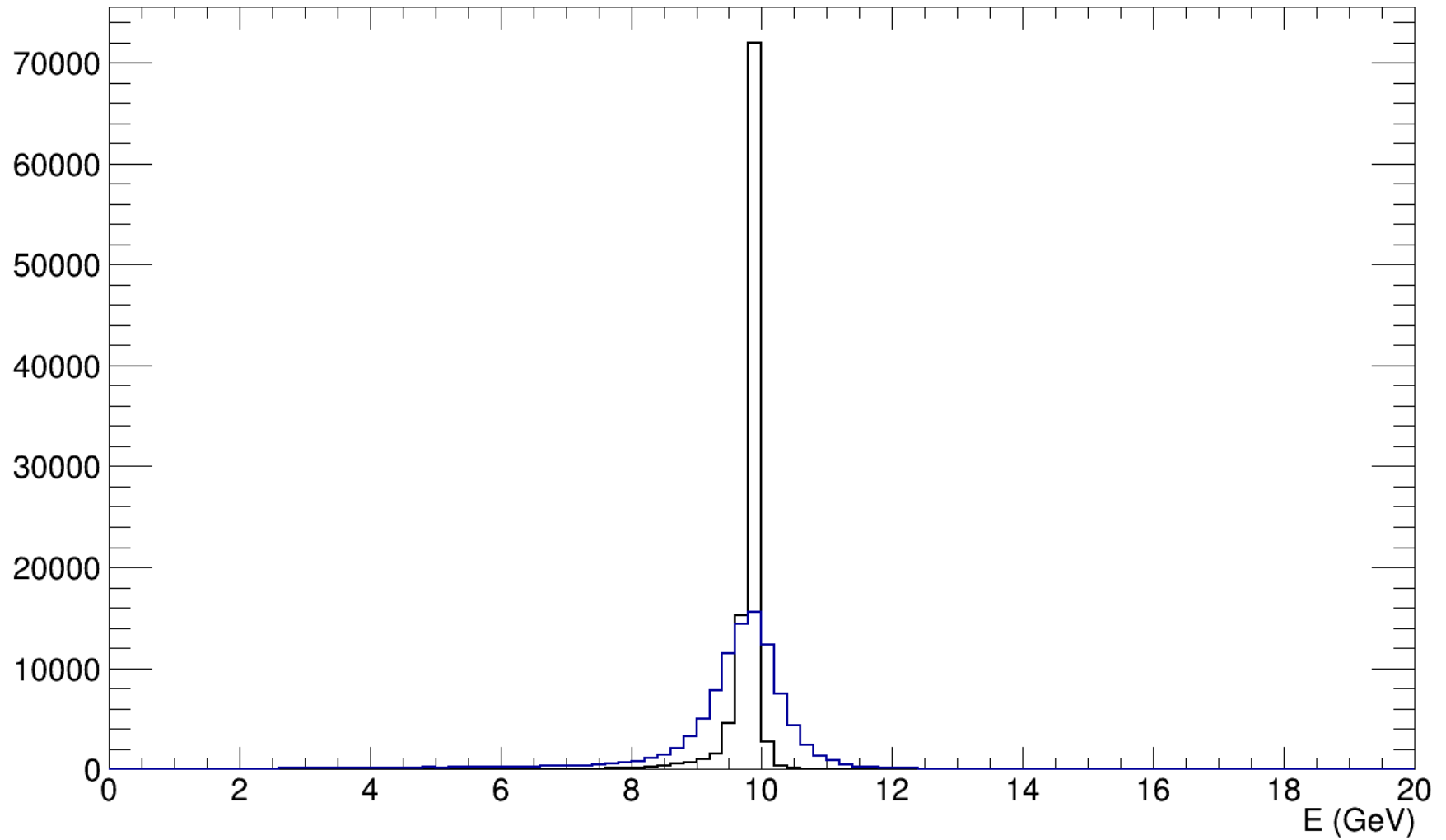
Pt (electron)



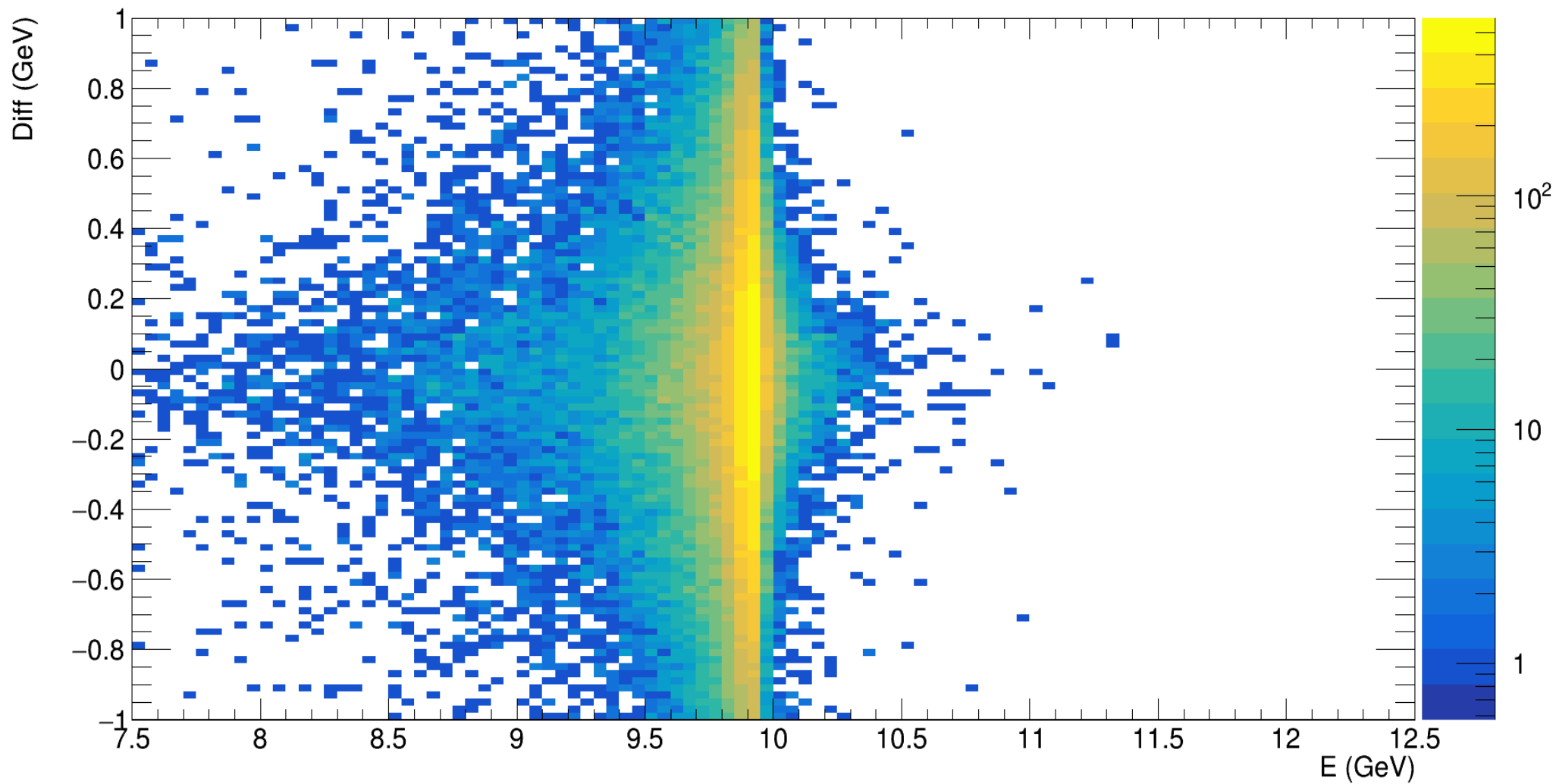
Reconstructed - Generated



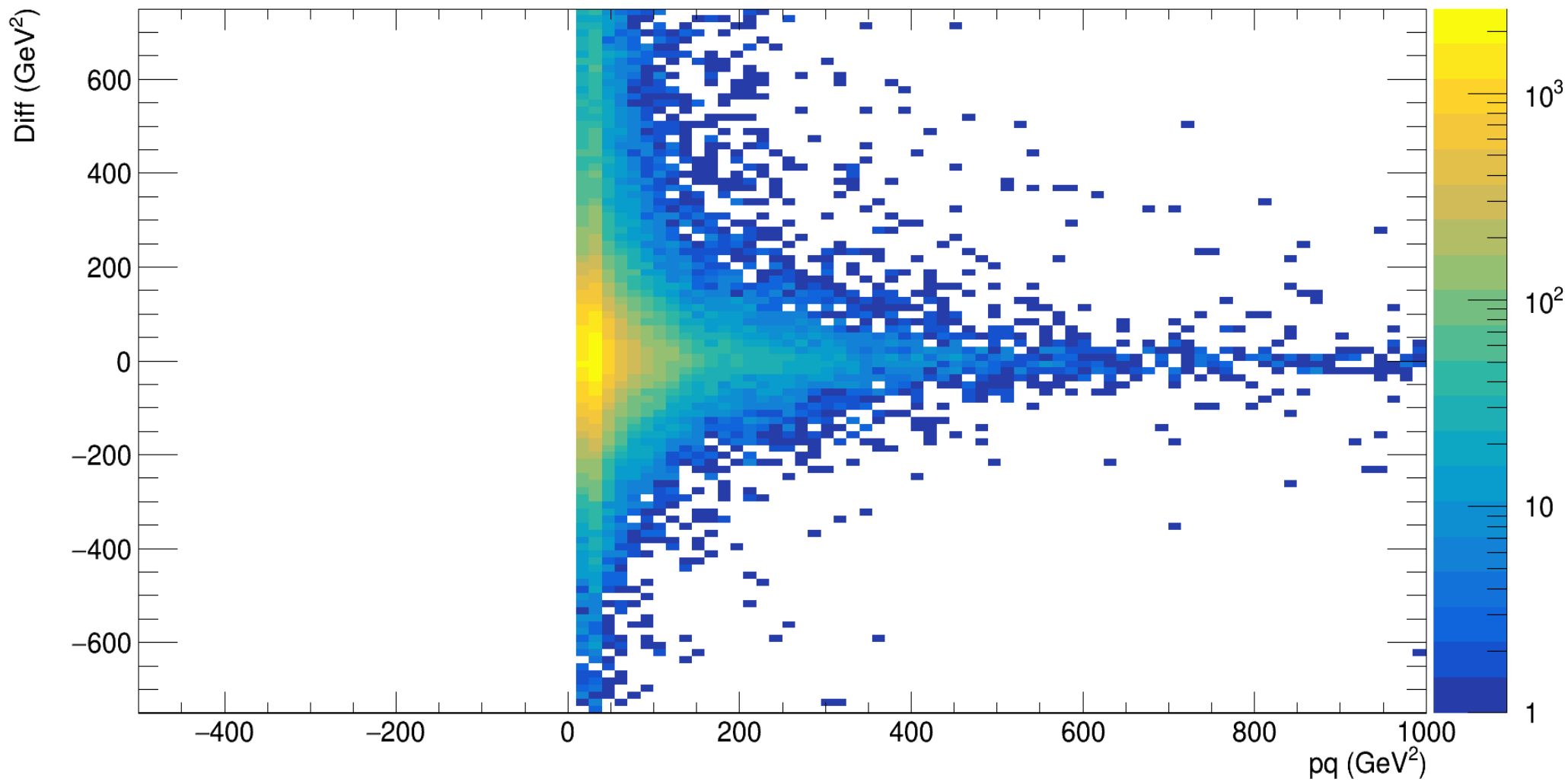
E (electron)



Reconstructed - Generated



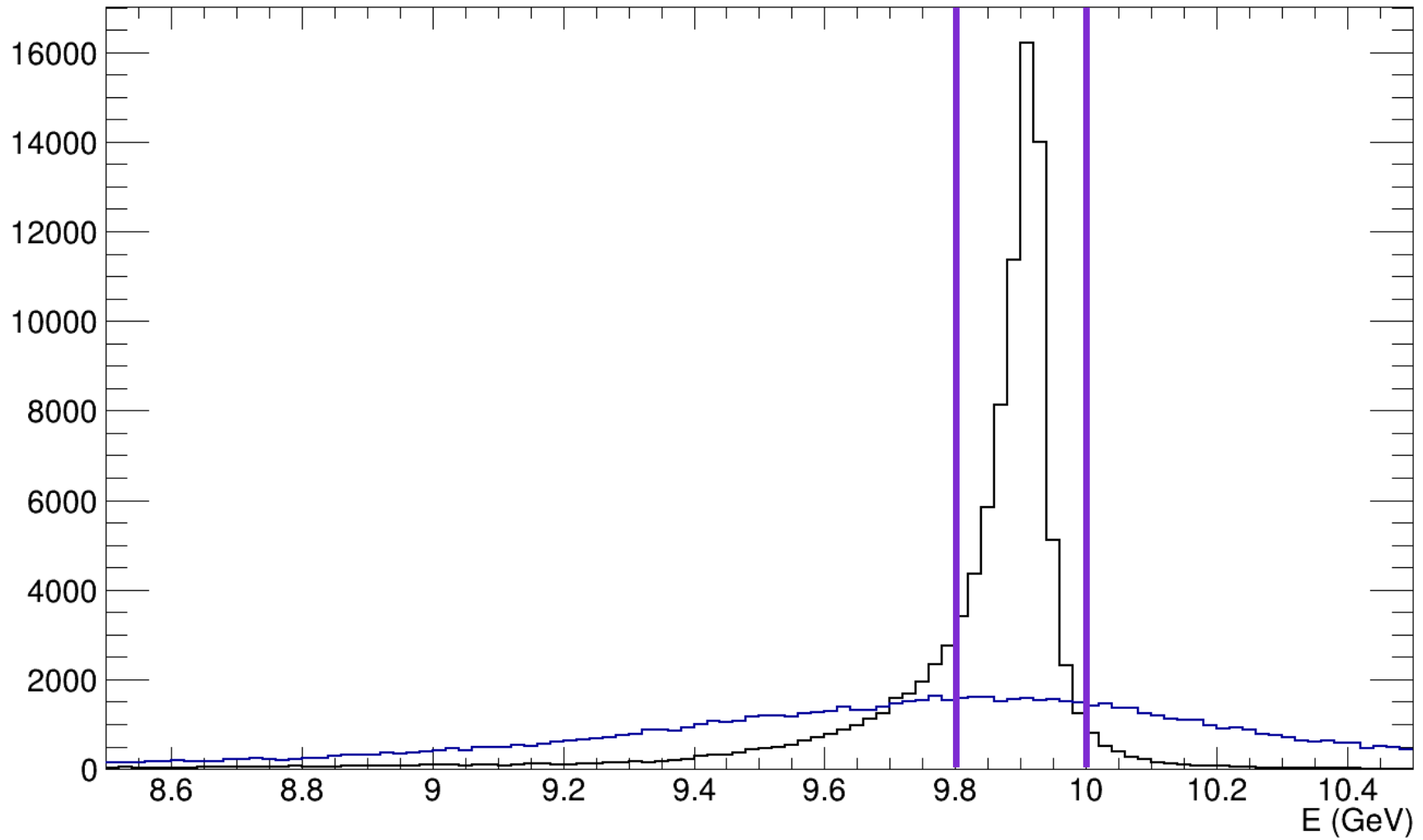
Difference of pq



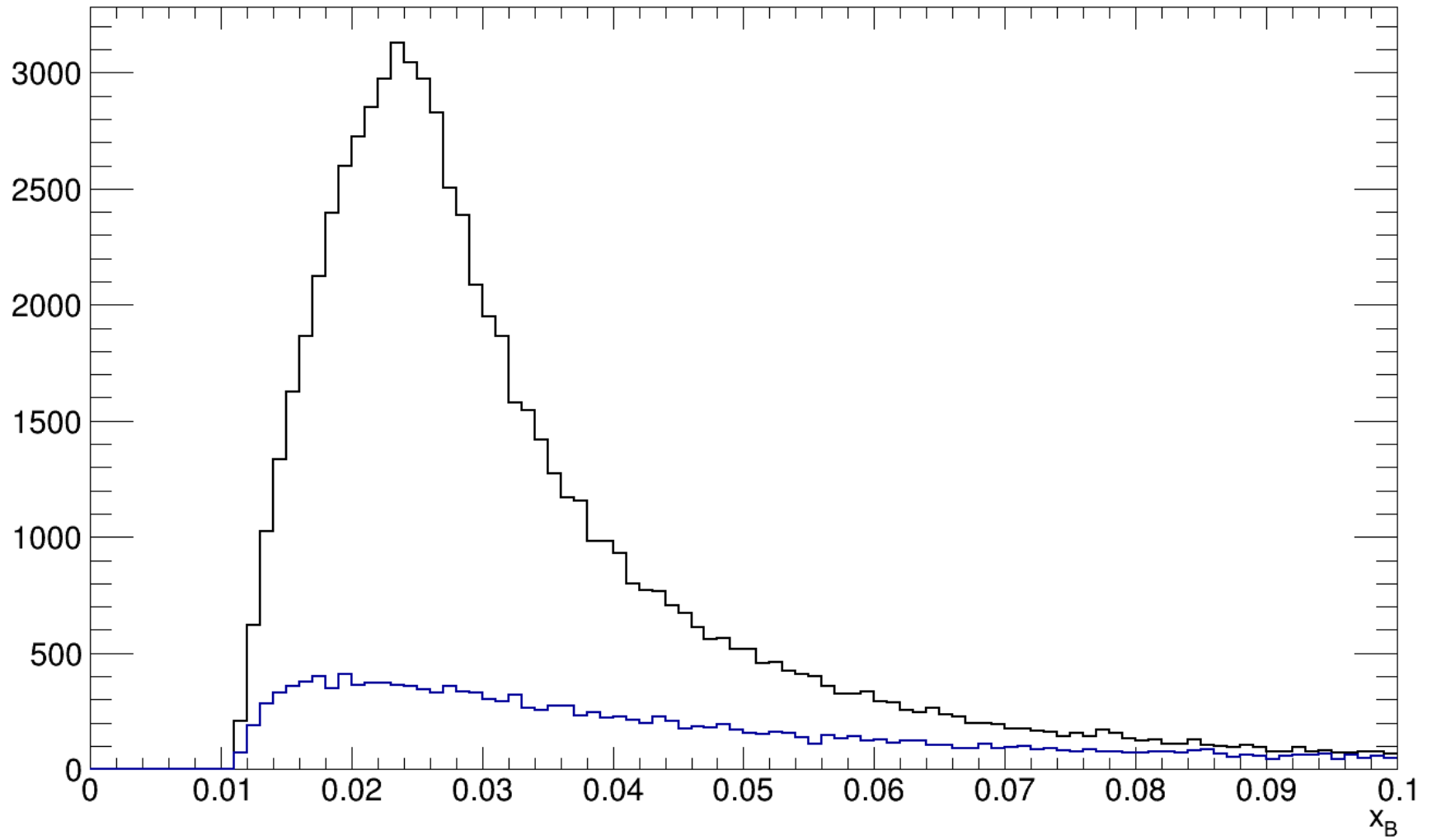
Smearing

- The difference of the reconstructed x_B and the generated x_B is likely from the smearing.

Apply Cuts on the Energy



x_B after the Cut



Next

Look at the pion and decay photons.