

Measuring the prompt component of the atmospheric muon flux

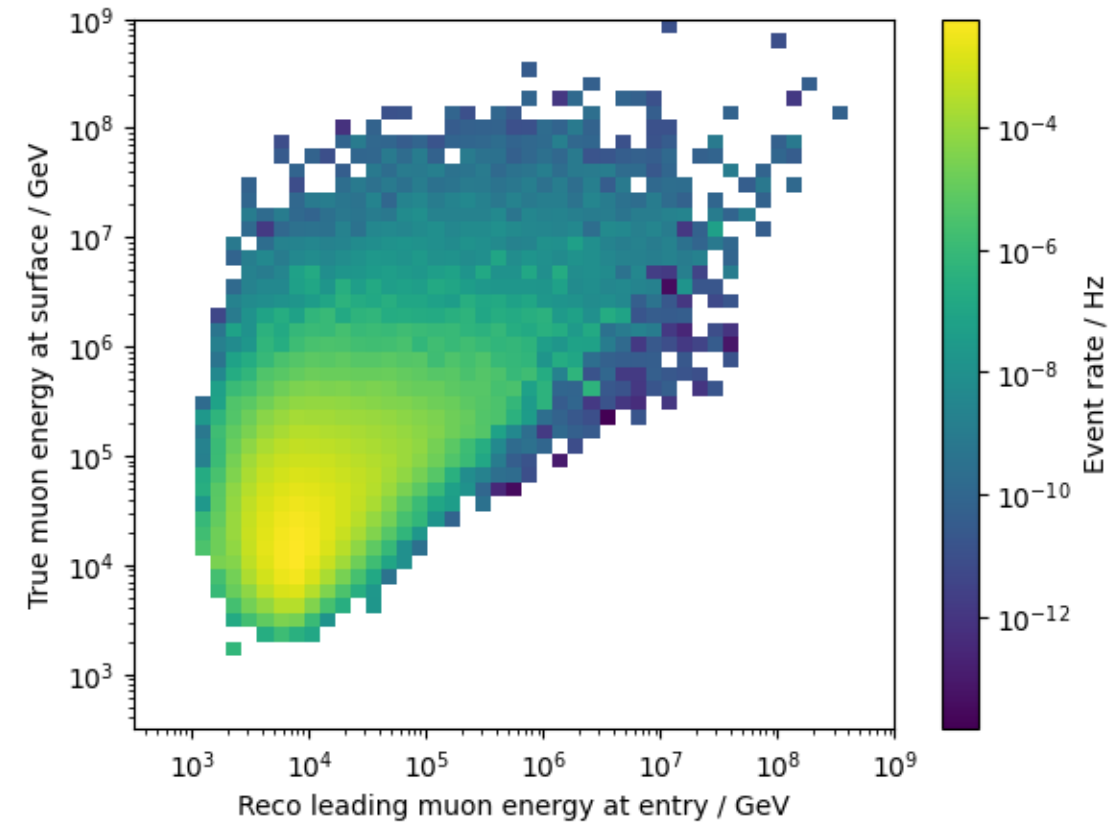
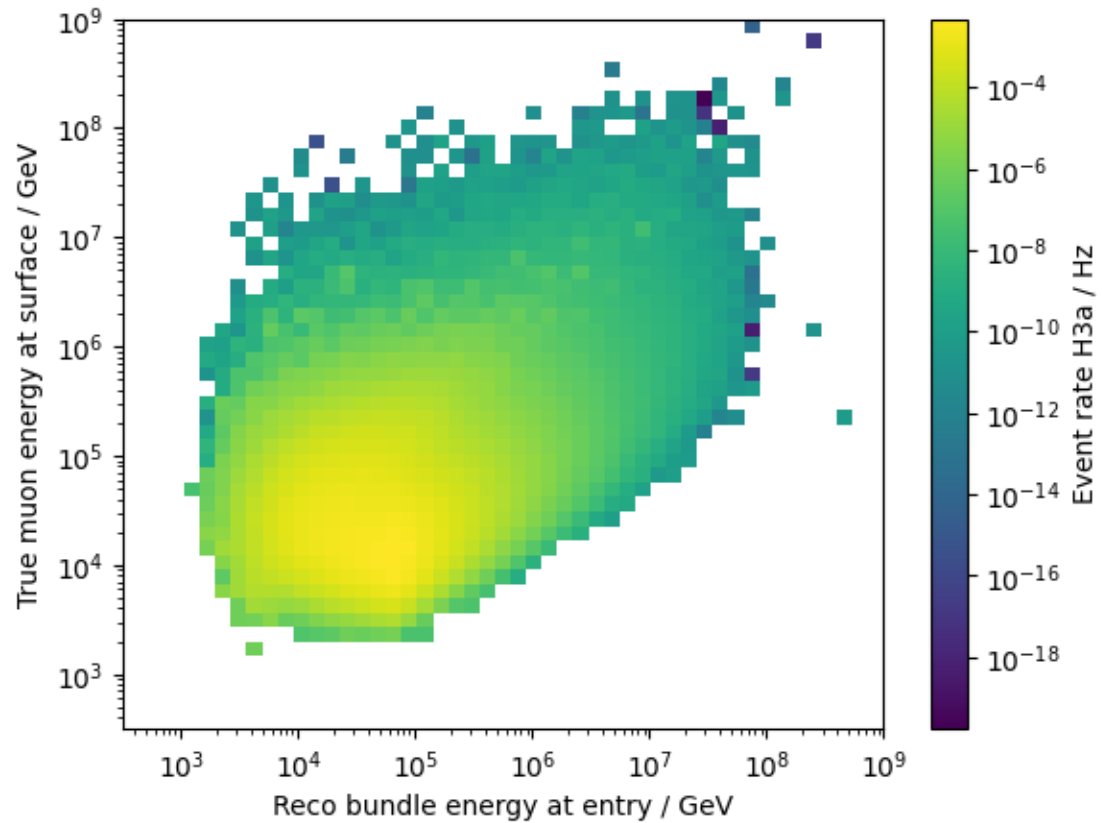
Pascal Gutjahr

June 20, 2024

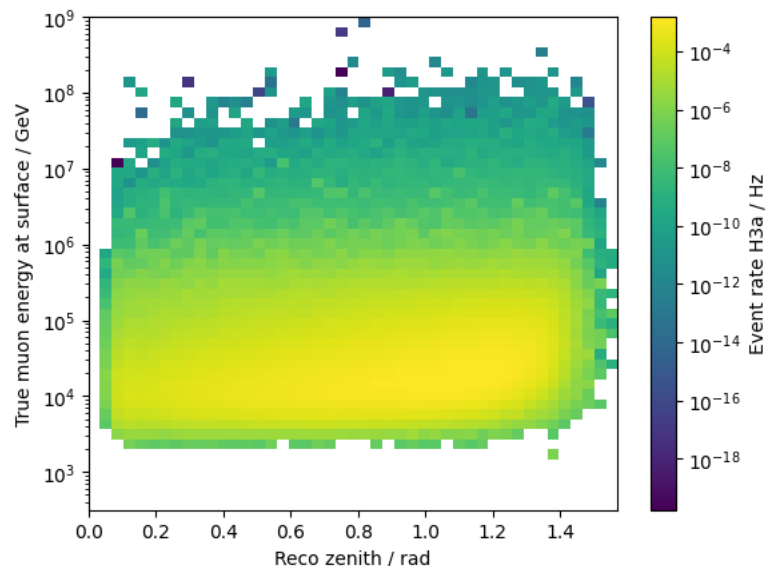
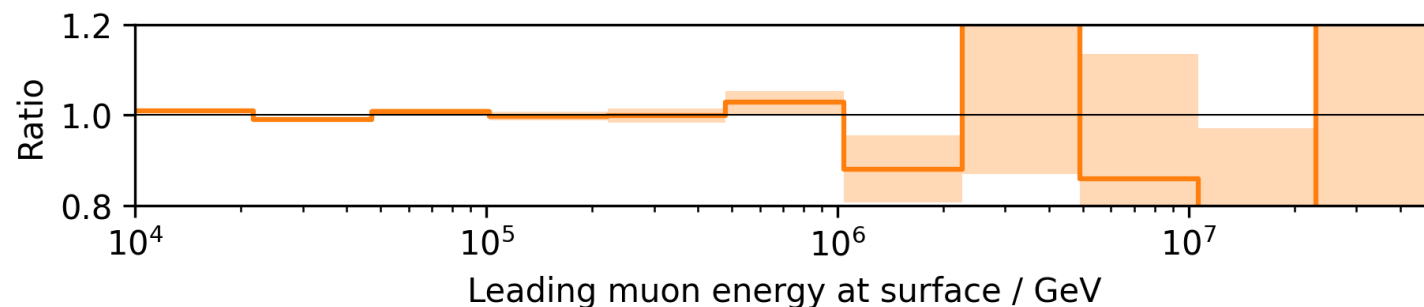
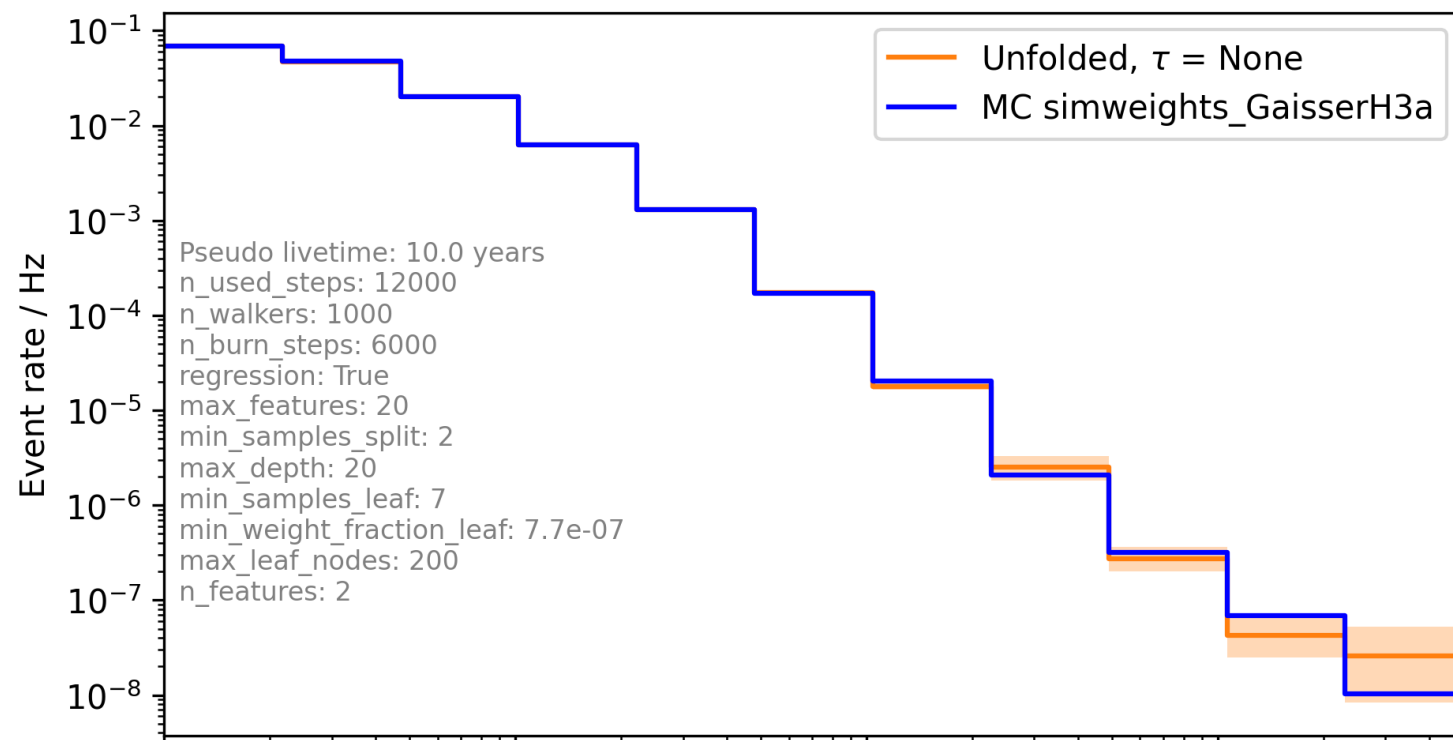
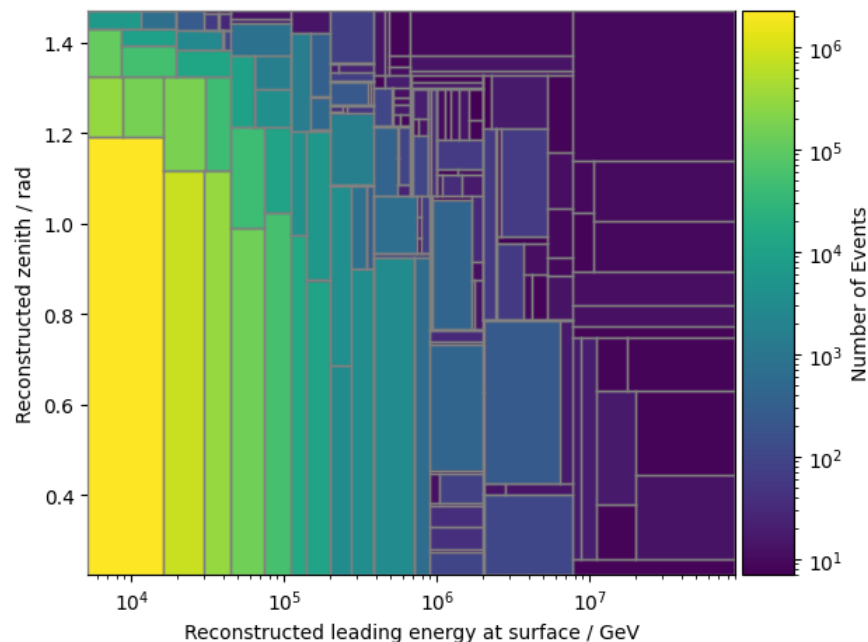
Muons

Source: NASA

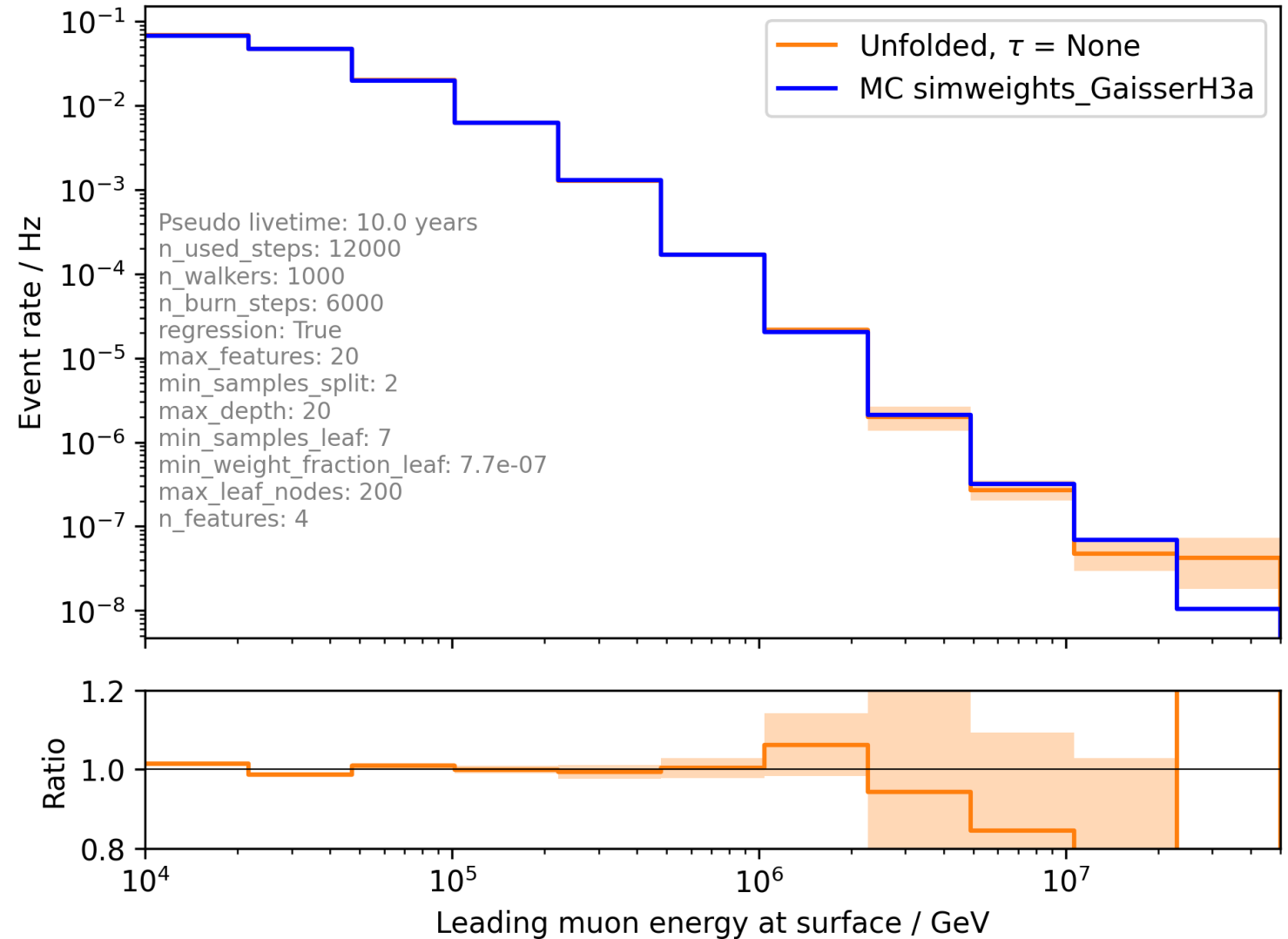
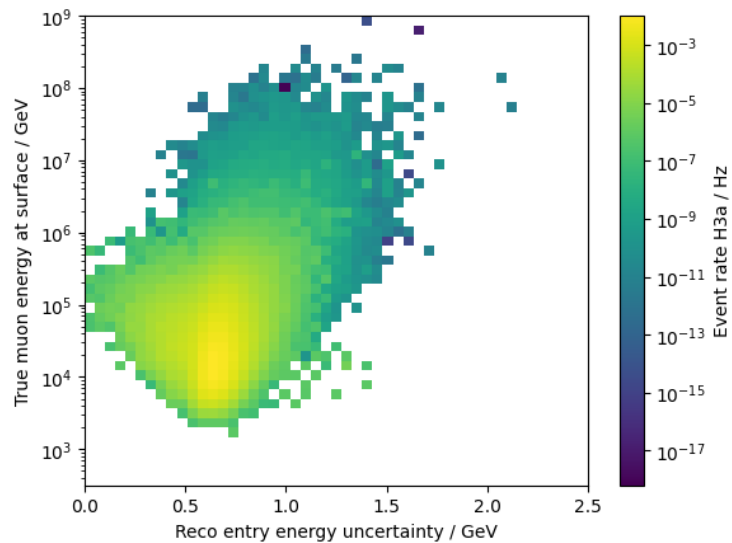
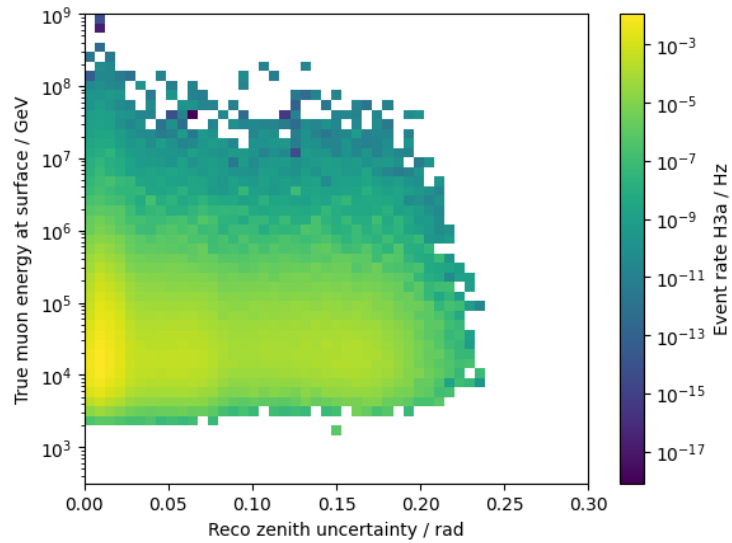
Proxy variables – v1110-rc1



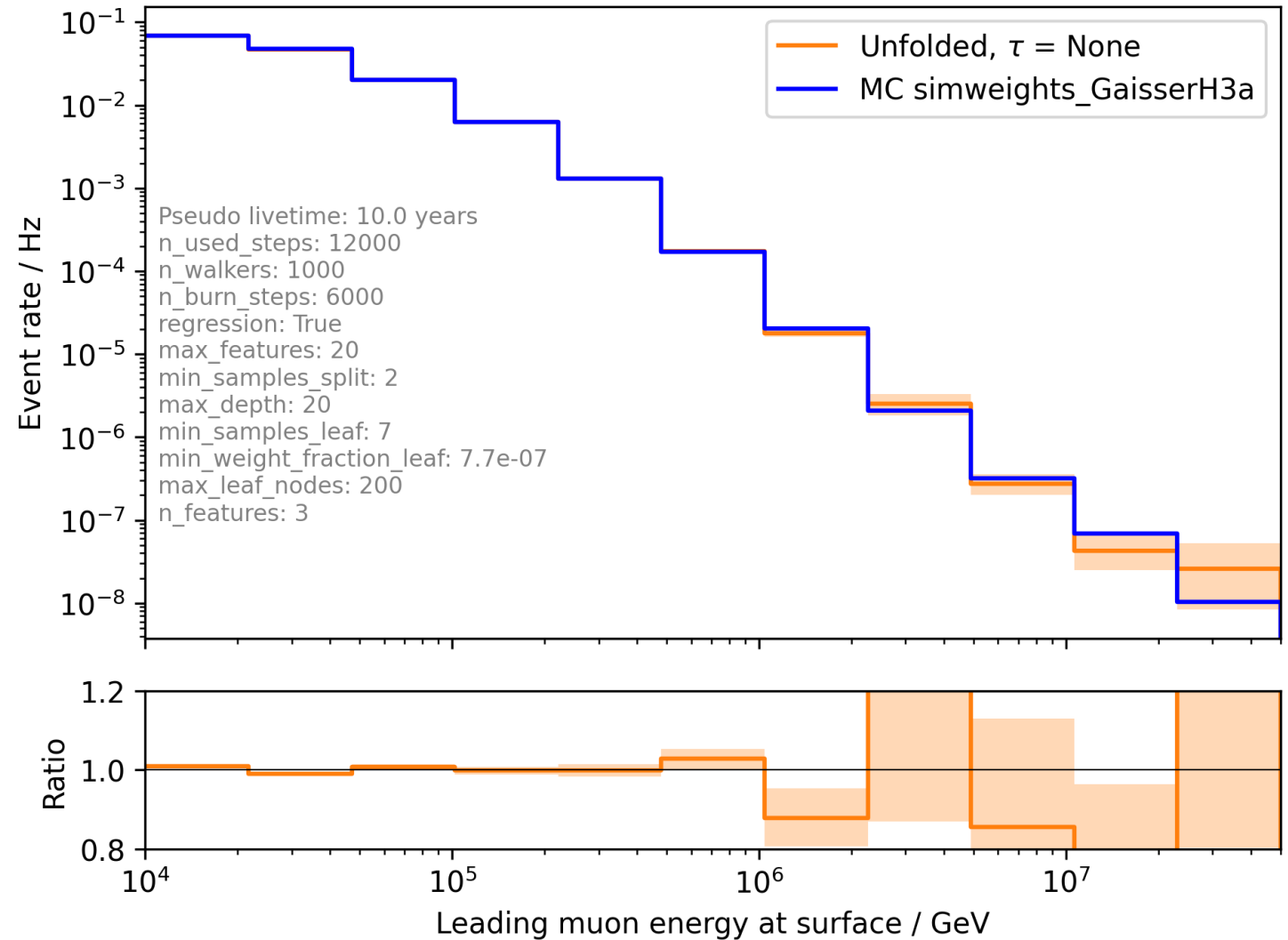
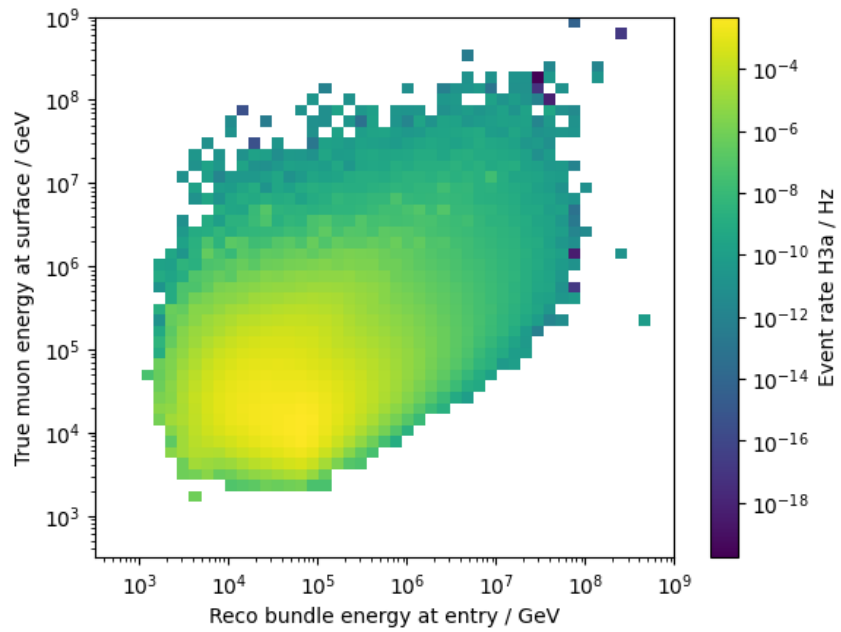
Unfolded event rate – v1110-rc1 (leading energy + zenith)



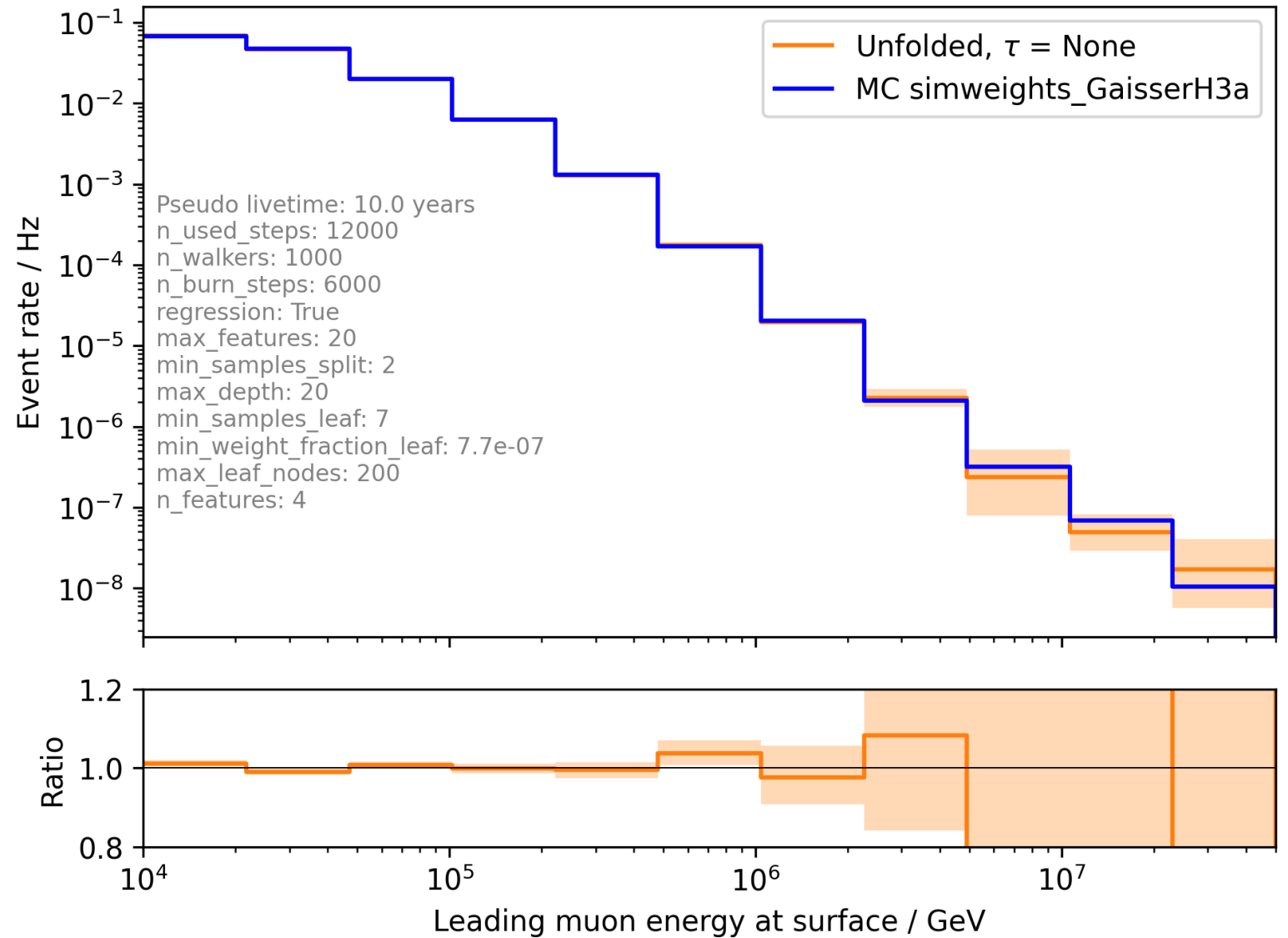
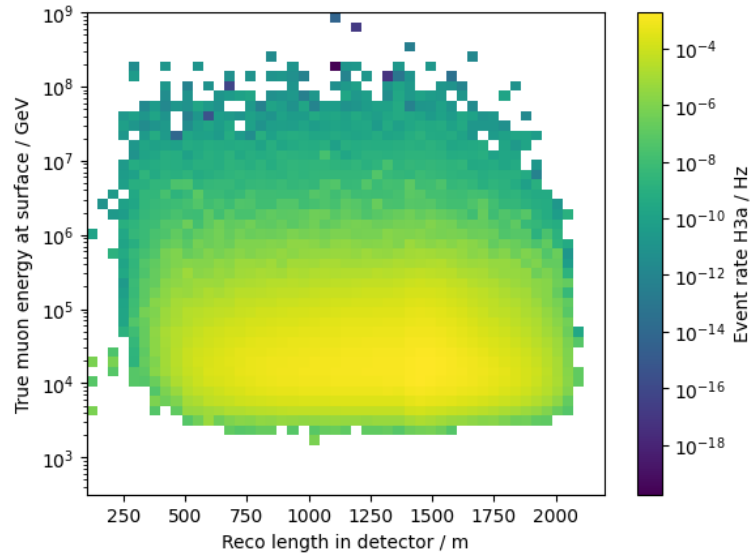
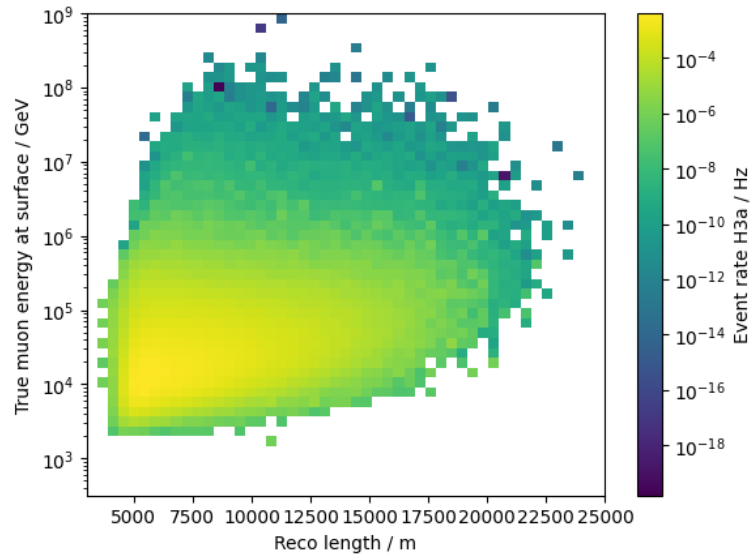
Unfolded event rate – v1110-rc1 (+ uncertainties)



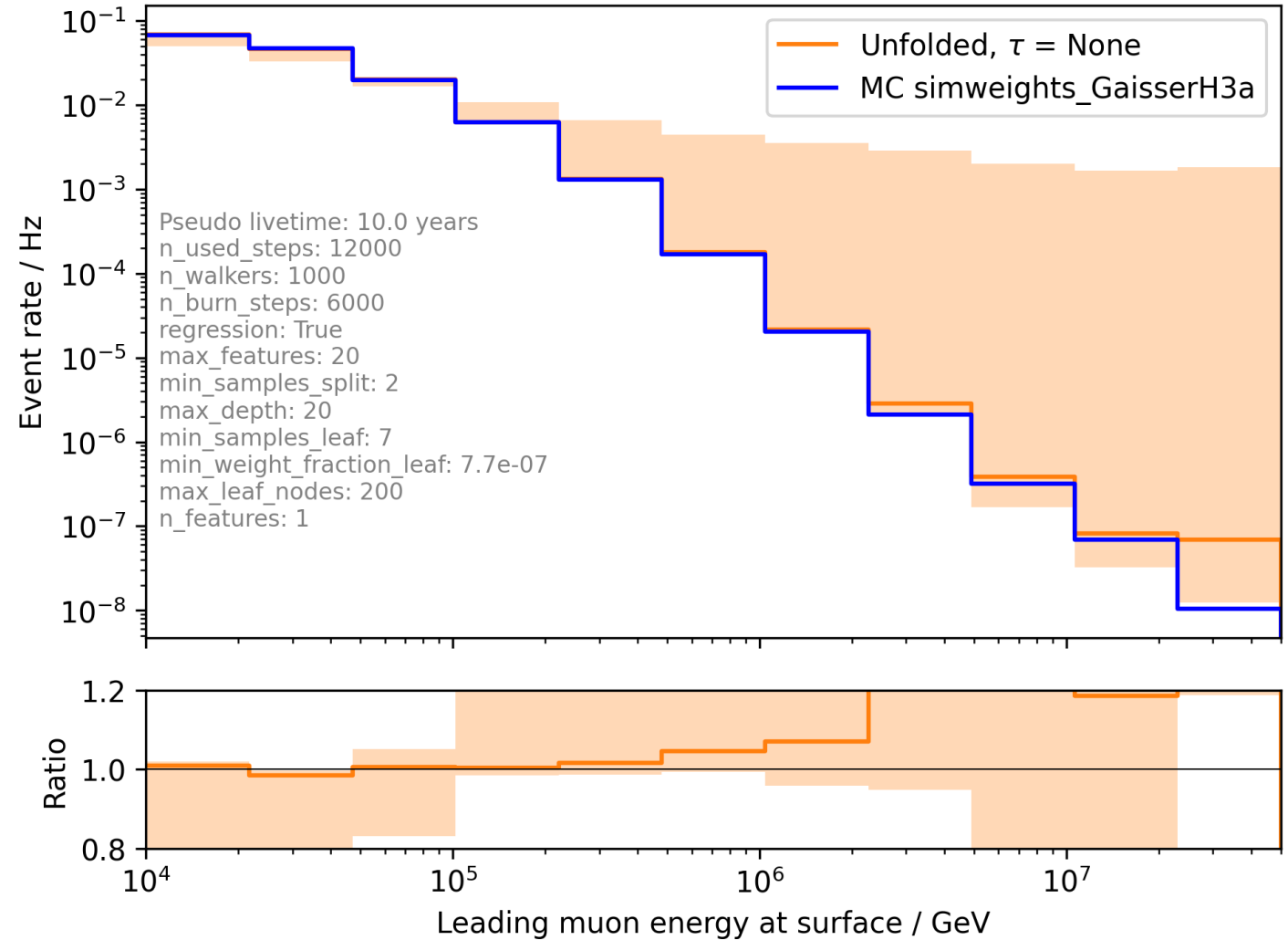
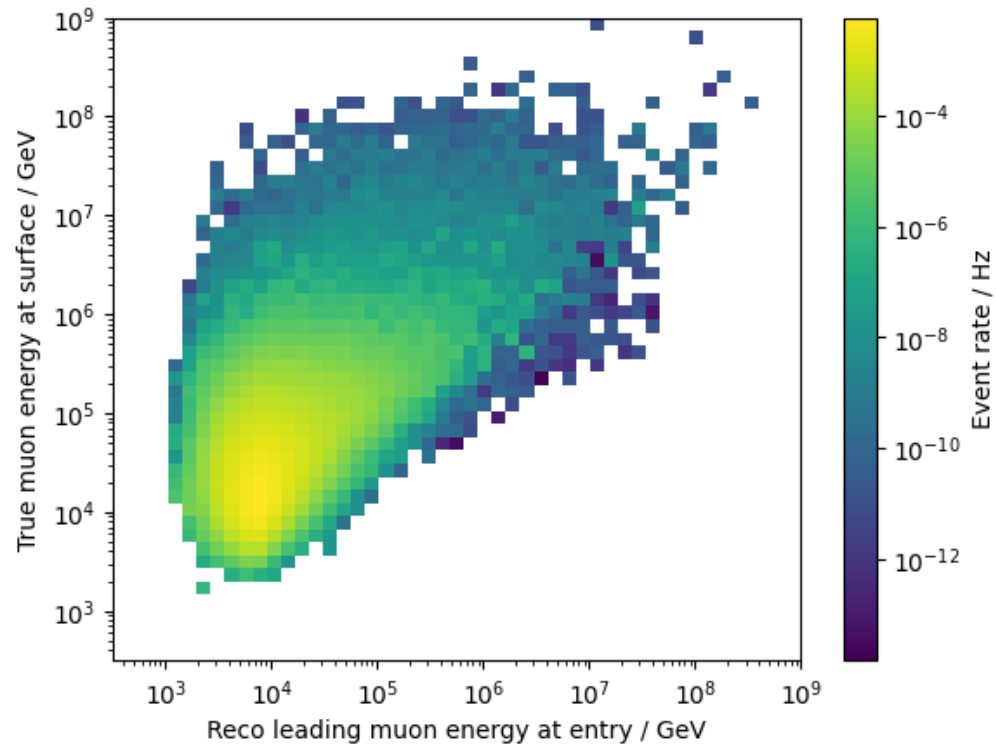
Unfolded event rate – v1110-rc1 (+ bundly energy proxy)



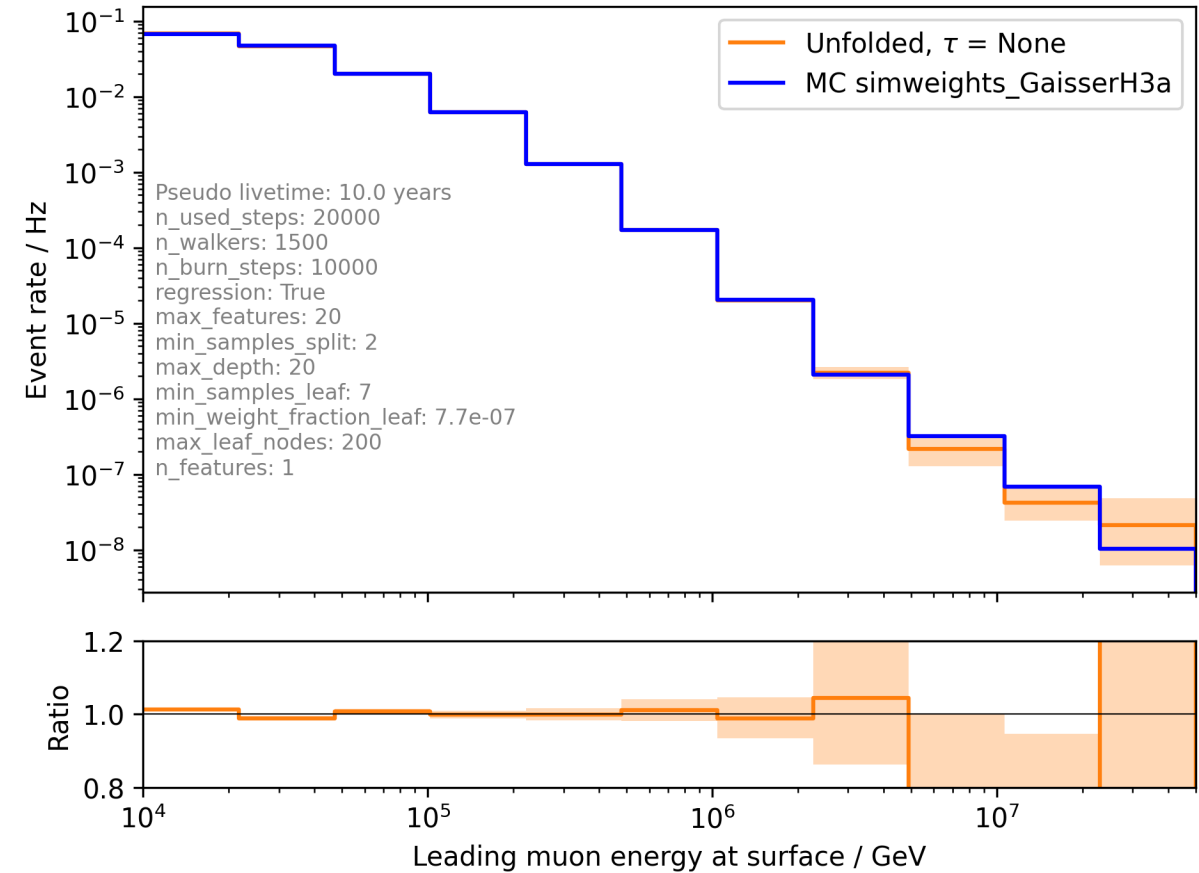
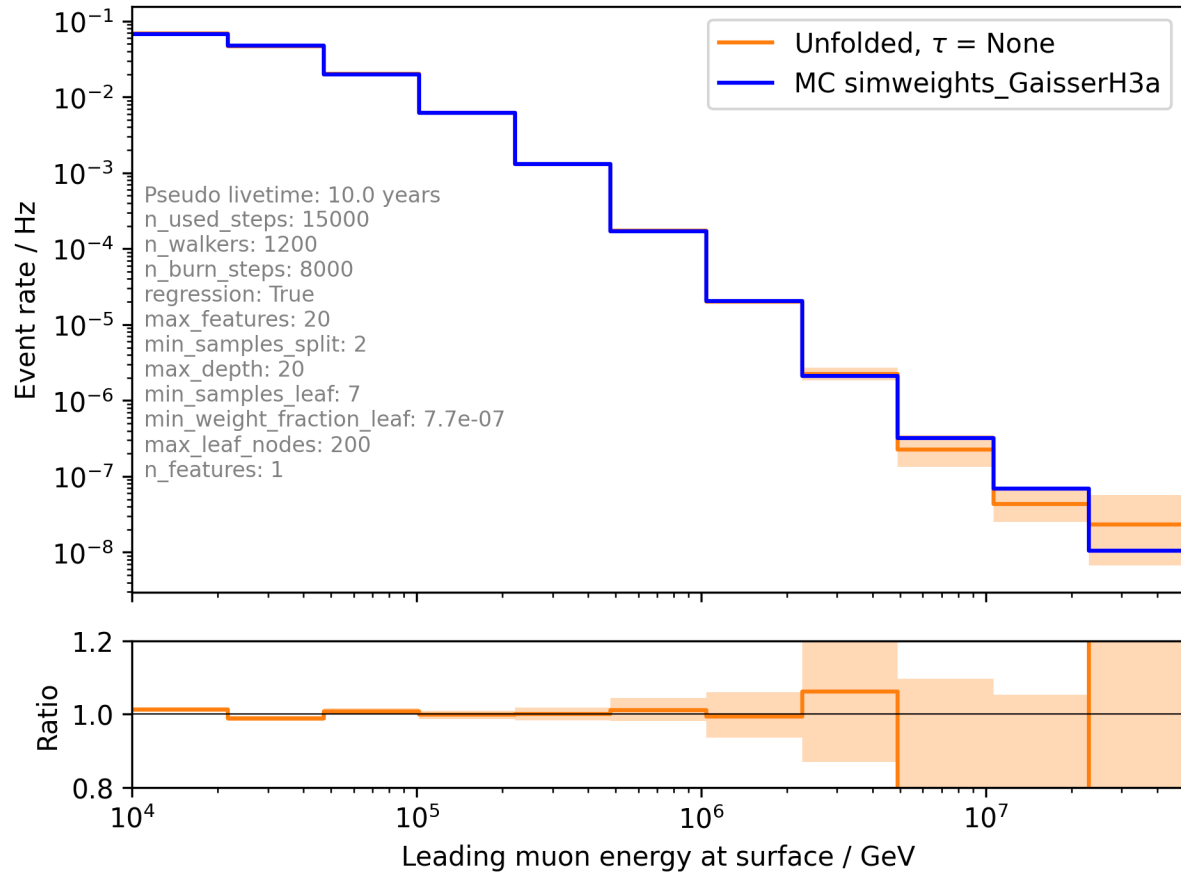
Unfolded event rate – v1110-rc1 (+ length and length in detector)



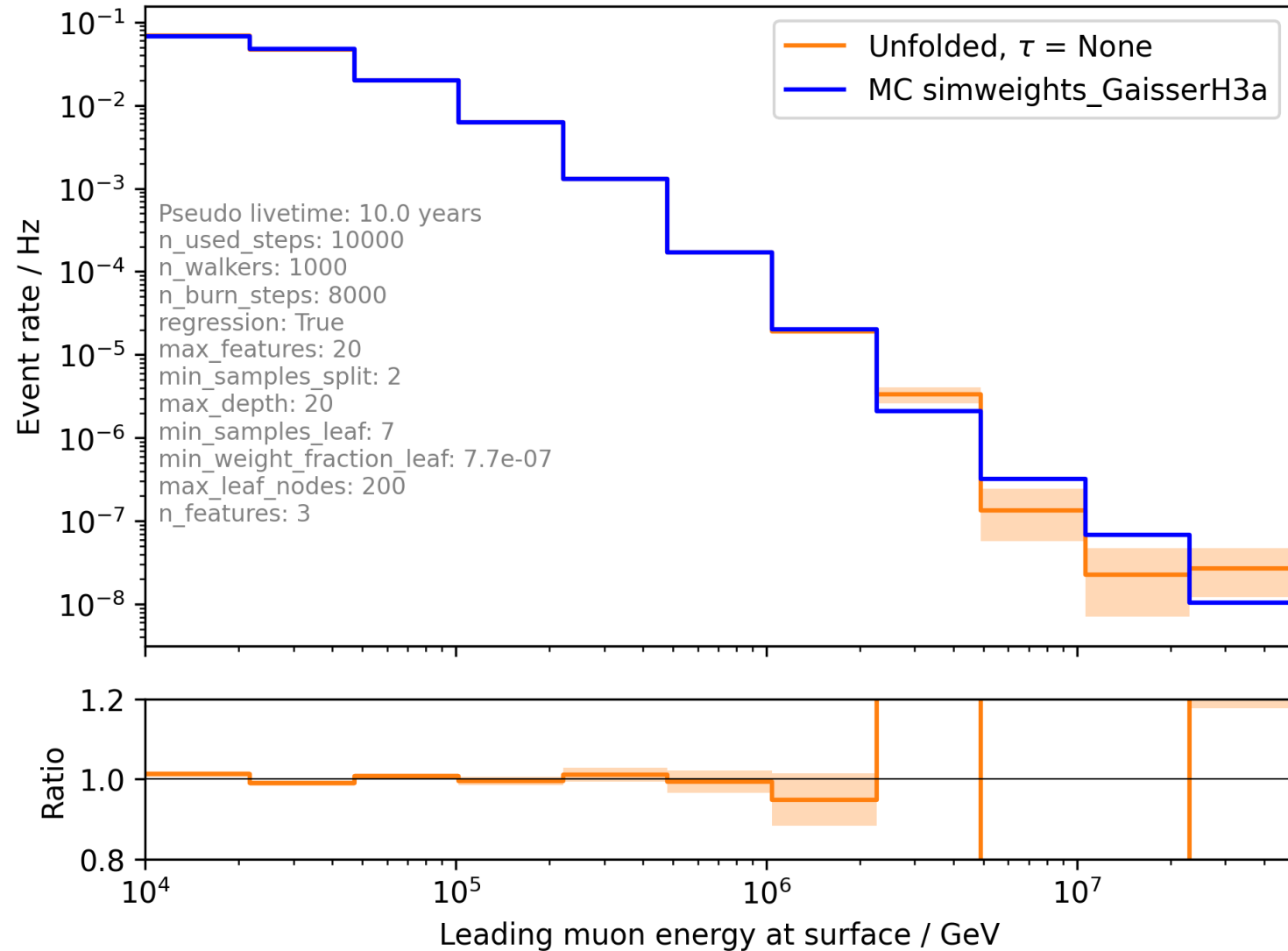
Unfolded event rate – v1110-rc1 (only leading energy)



Unfolded event rate – v1110-rc1 (only leading energy) – more steps



Unfolded event rate – v1110-rc1 (leading energy + uncertainty and length)

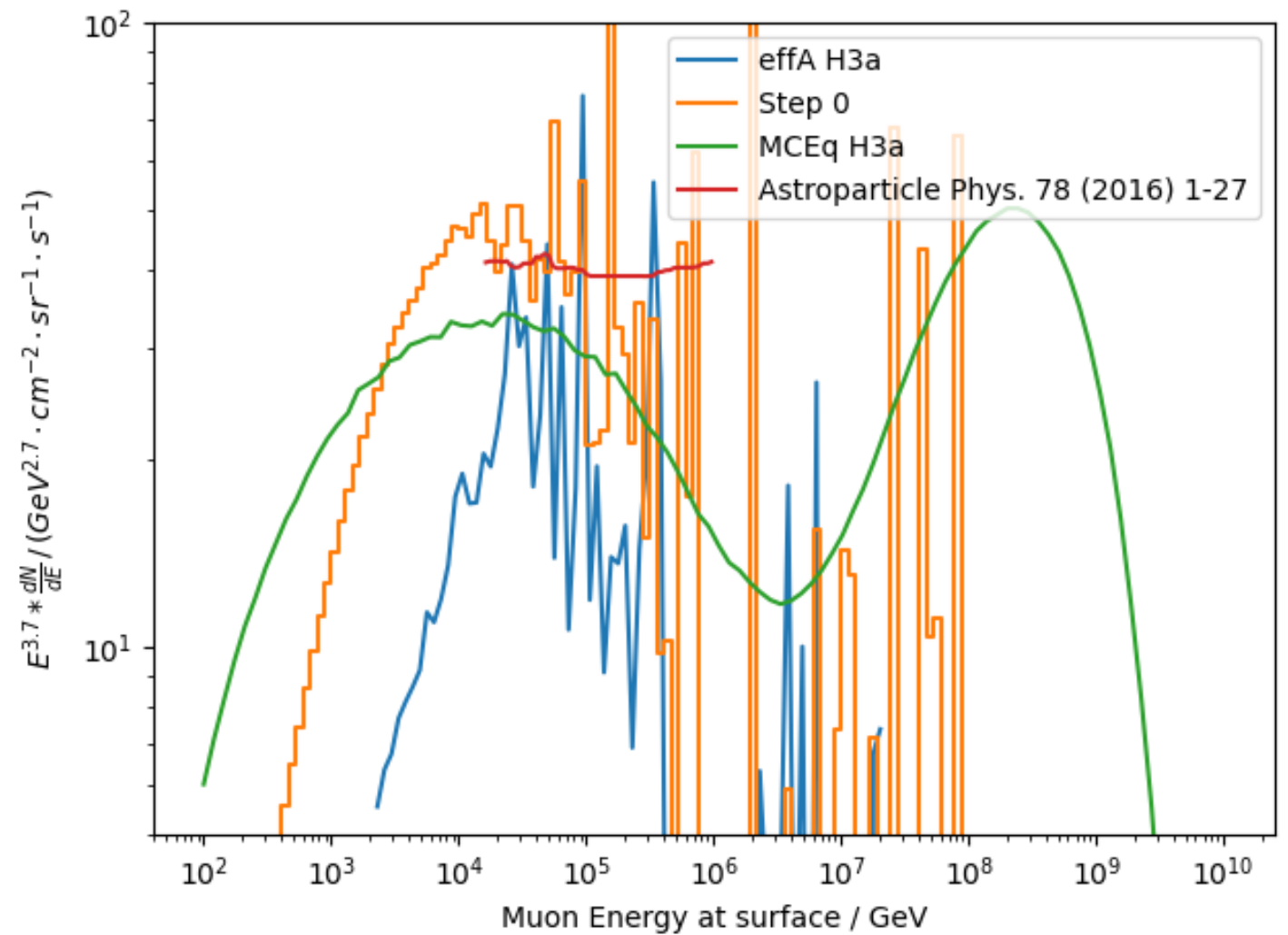


Effective Area

- lower energy bound: 10 TeV

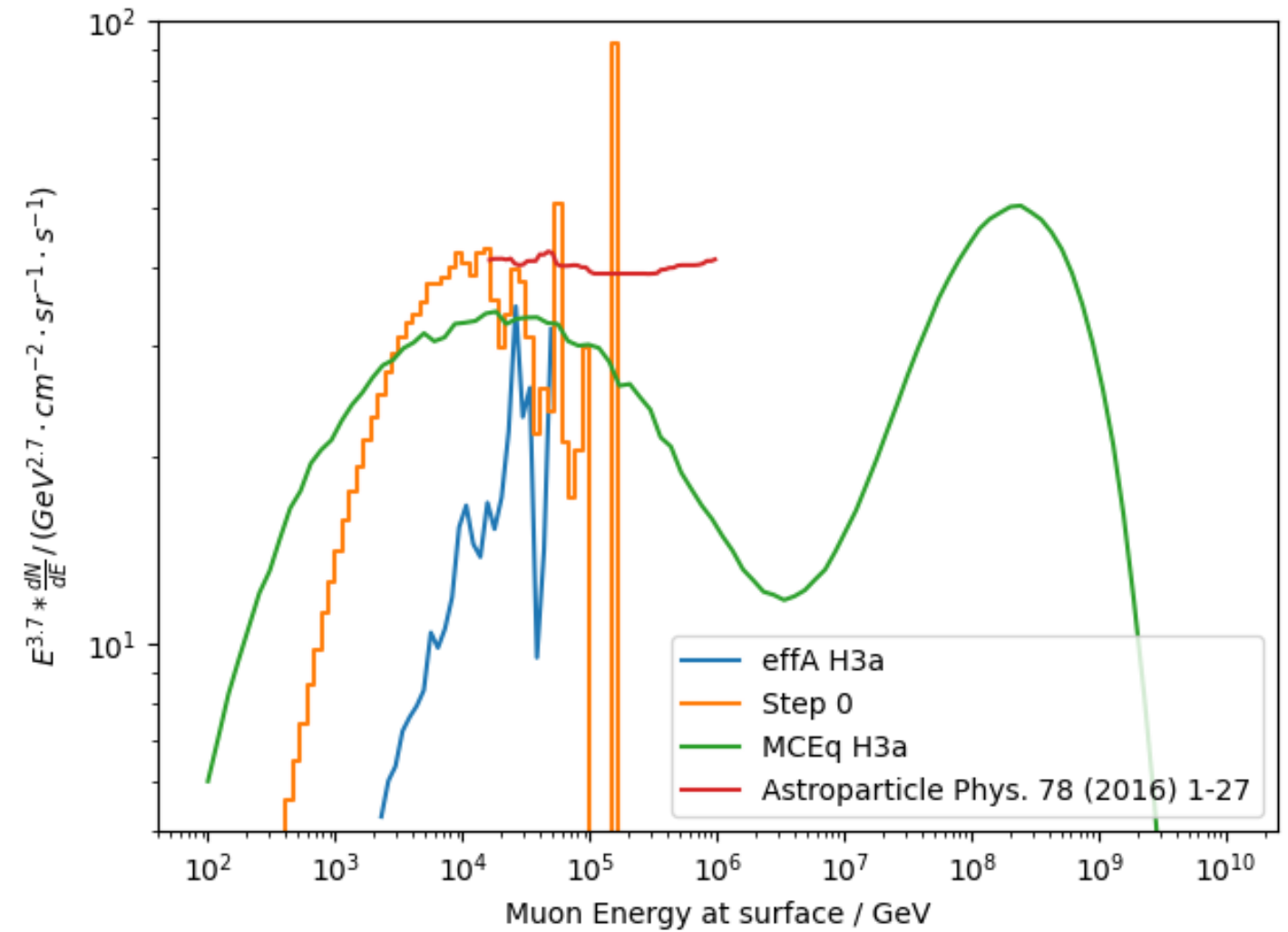
Muon flux at surface

- cylinder $r = 700\text{m}$, $l = 1400\text{m}$



Muon flux at surface

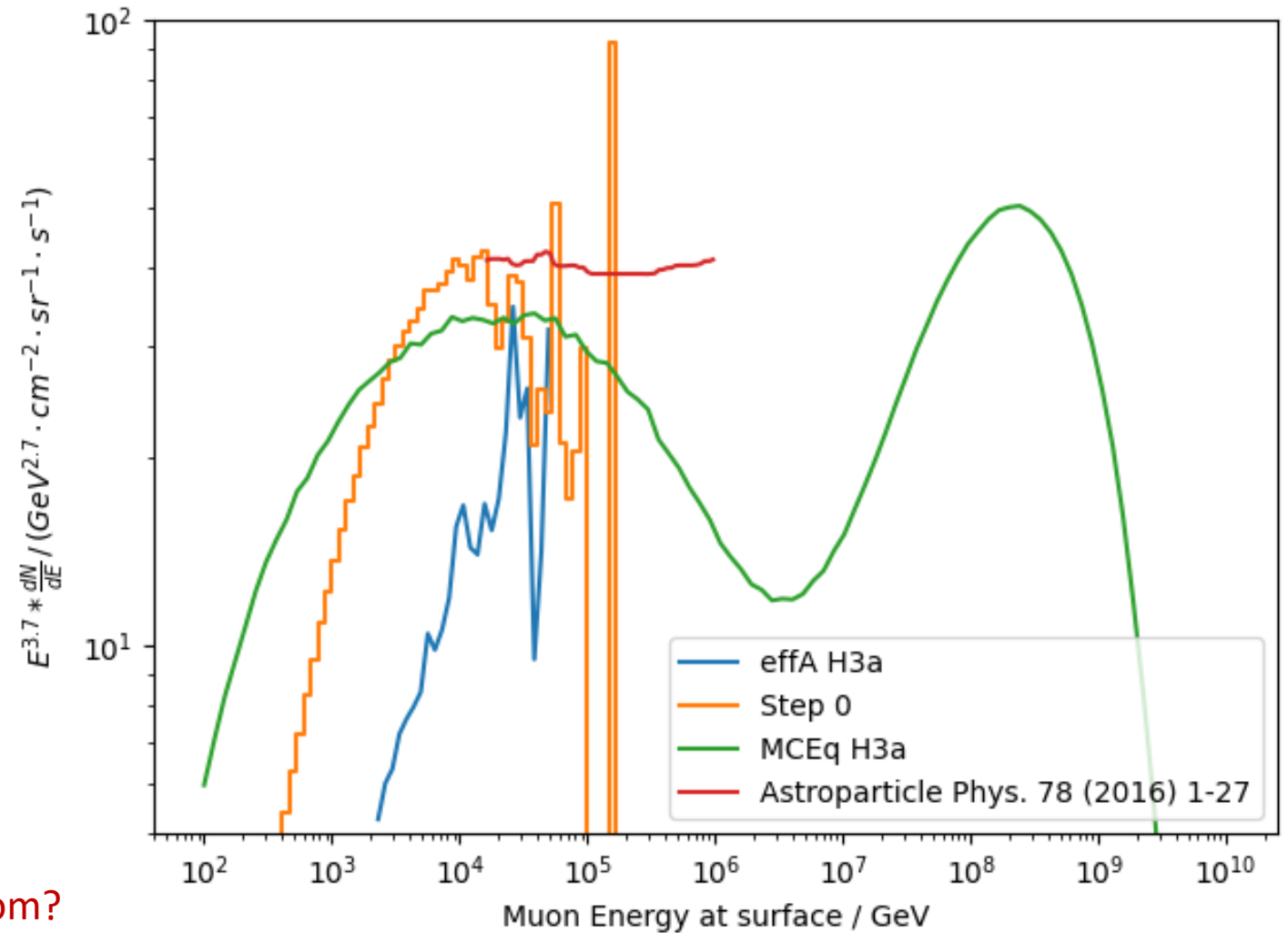
- load 22774 only
- convex hull ext. 200m



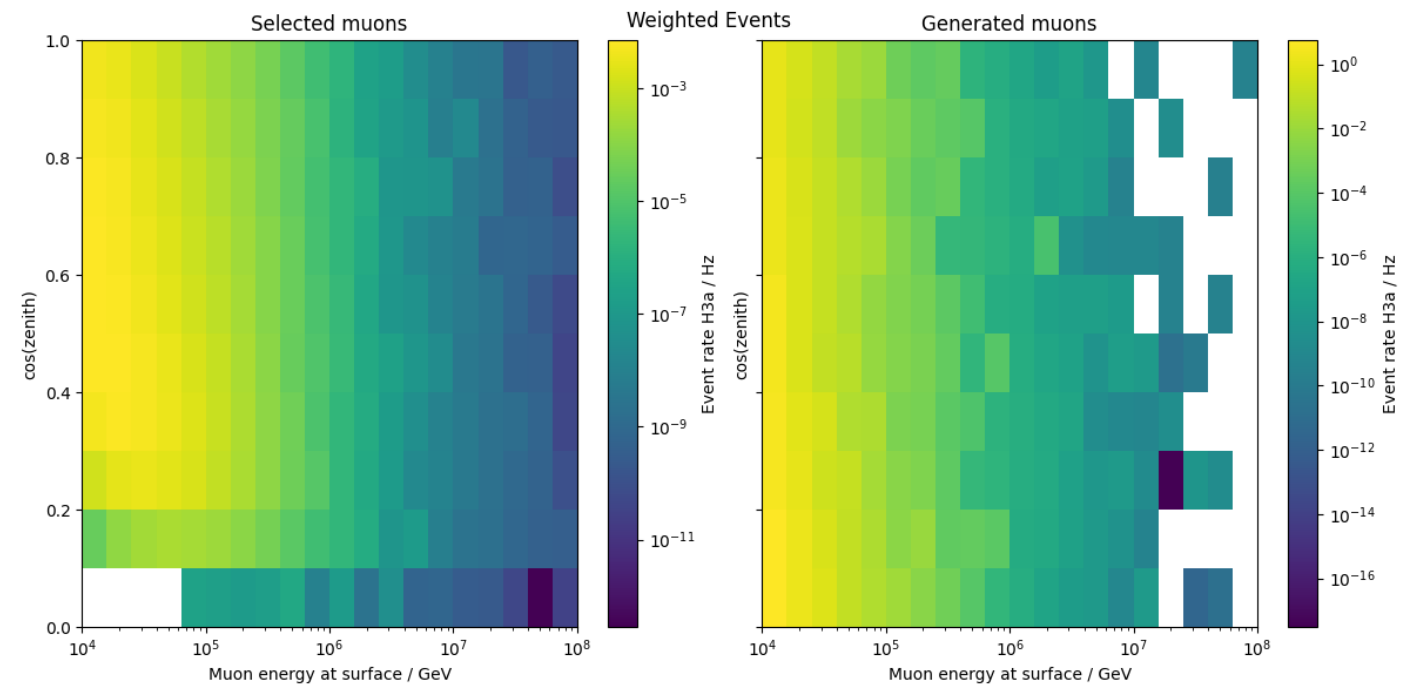
Muon flux at surface

- load 22774 only
- cylinder $r = 700\text{m}$, $l = 1400\text{m}$

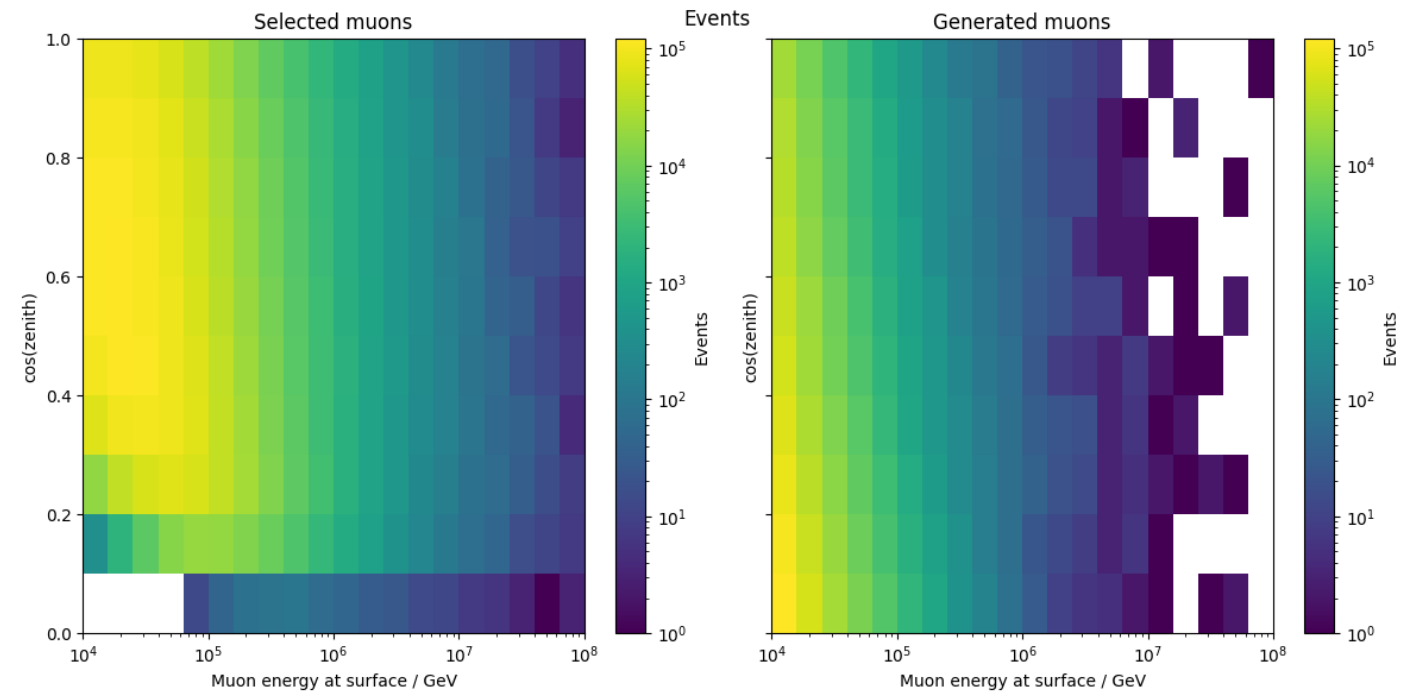
- cylinder and convex hull have similar results
- but where is the difference in MCEq coming from?



Check statistics



Weighted



Unweighted