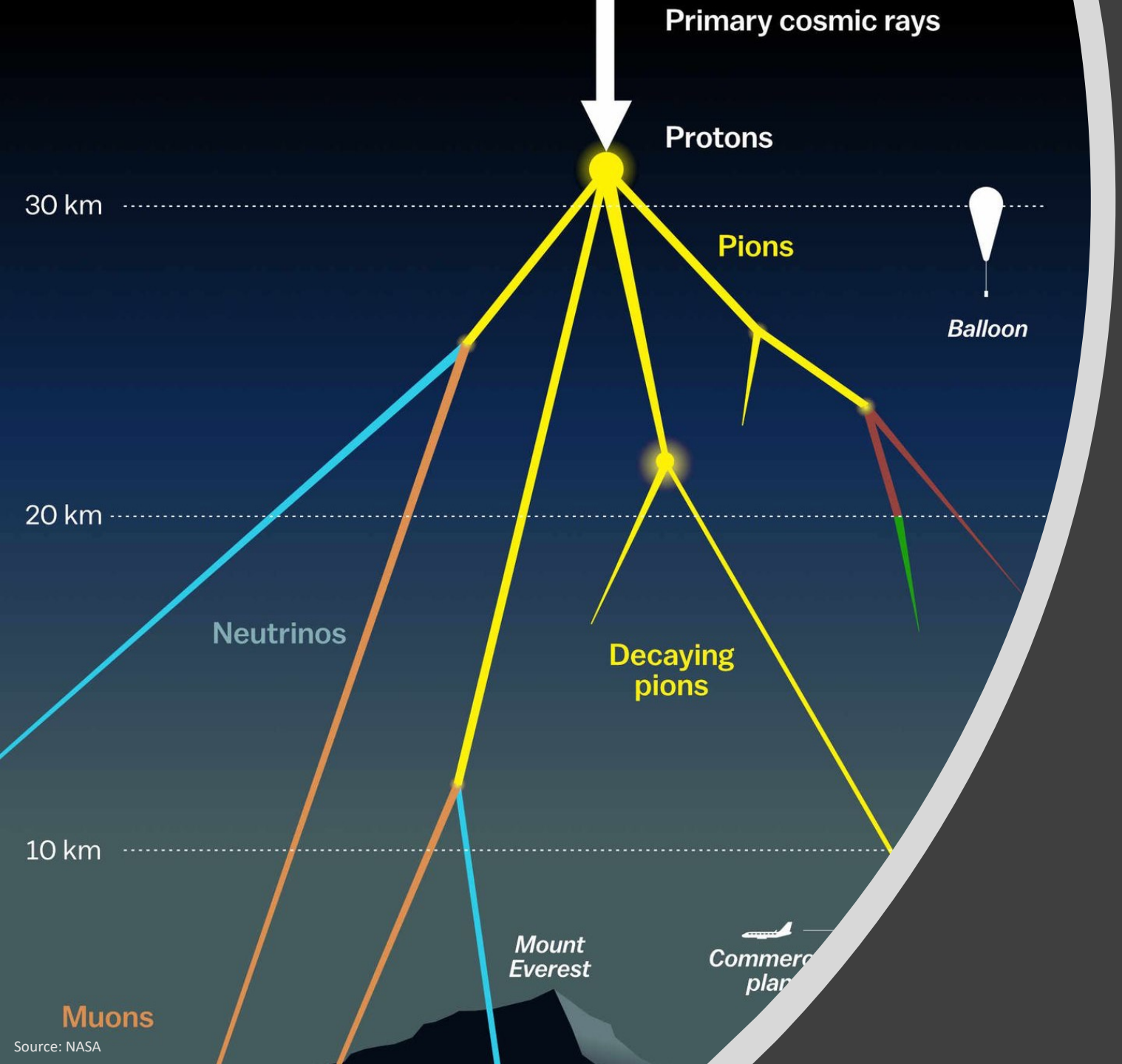


Measuring the prompt component of the atmospheric muon flux

Pascal Gutjahr

May 7, 2024

Multiplicity: charm vs unflavored

Charm

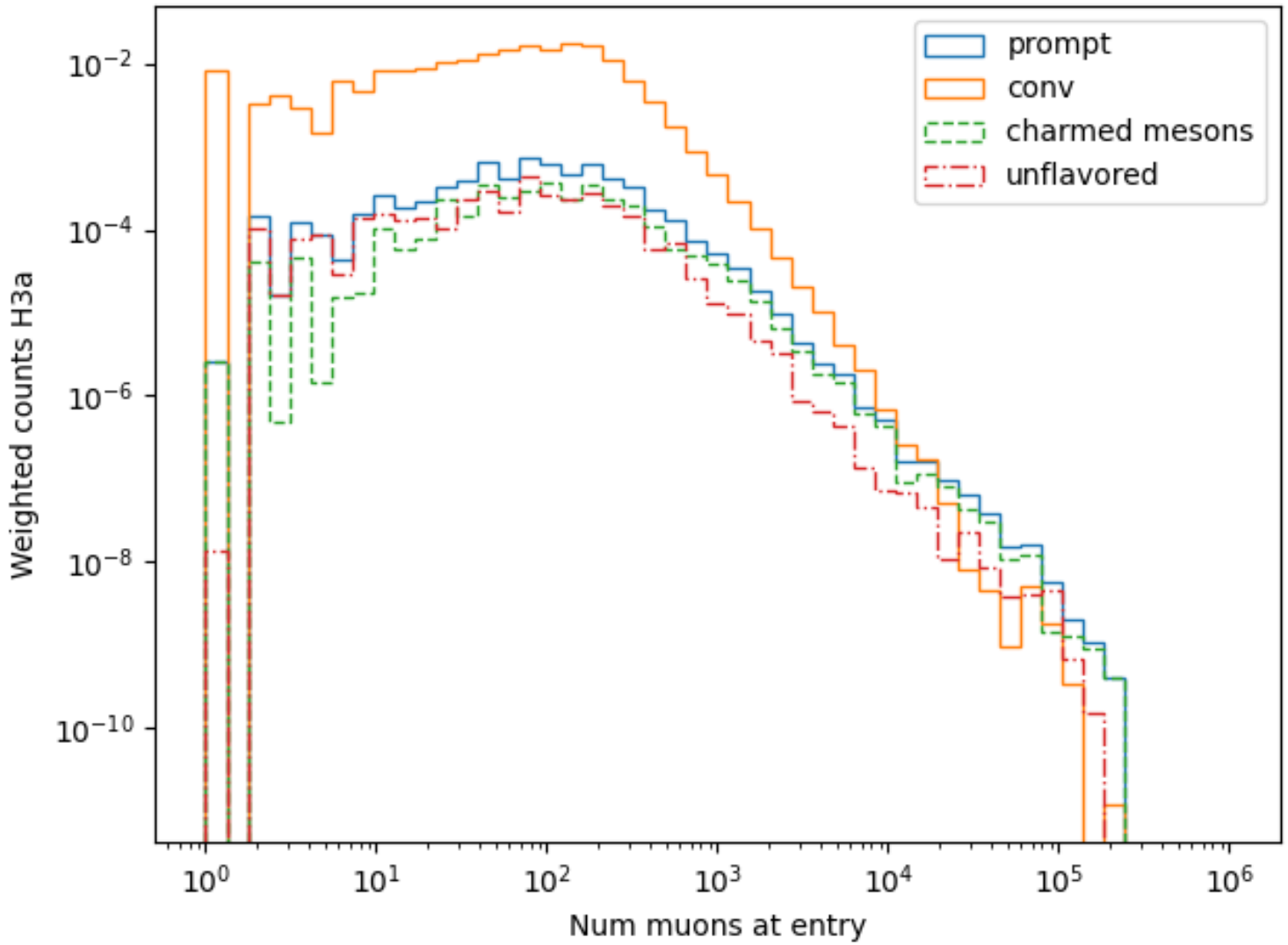
411: D+
413: D*(2010)+
421: D0
423: D*(2007)0
431: D(s)+
433: D(s)*+

Unflavored

113.0: rho(770)0
221.0: eta
223.0: omega(782)
333.0: phi(1020)
443.0: J/psi(1S)
4112.0: Sigma(c)(2455)0
4122.0: Lambda(c)+
4132.0: Xi(c)0
4212.0: Sigma(c)(2455)+
4222.0: Sigma(c)(2455)++
4232.0: Xi(c)+
4332.0: Omega(c)0

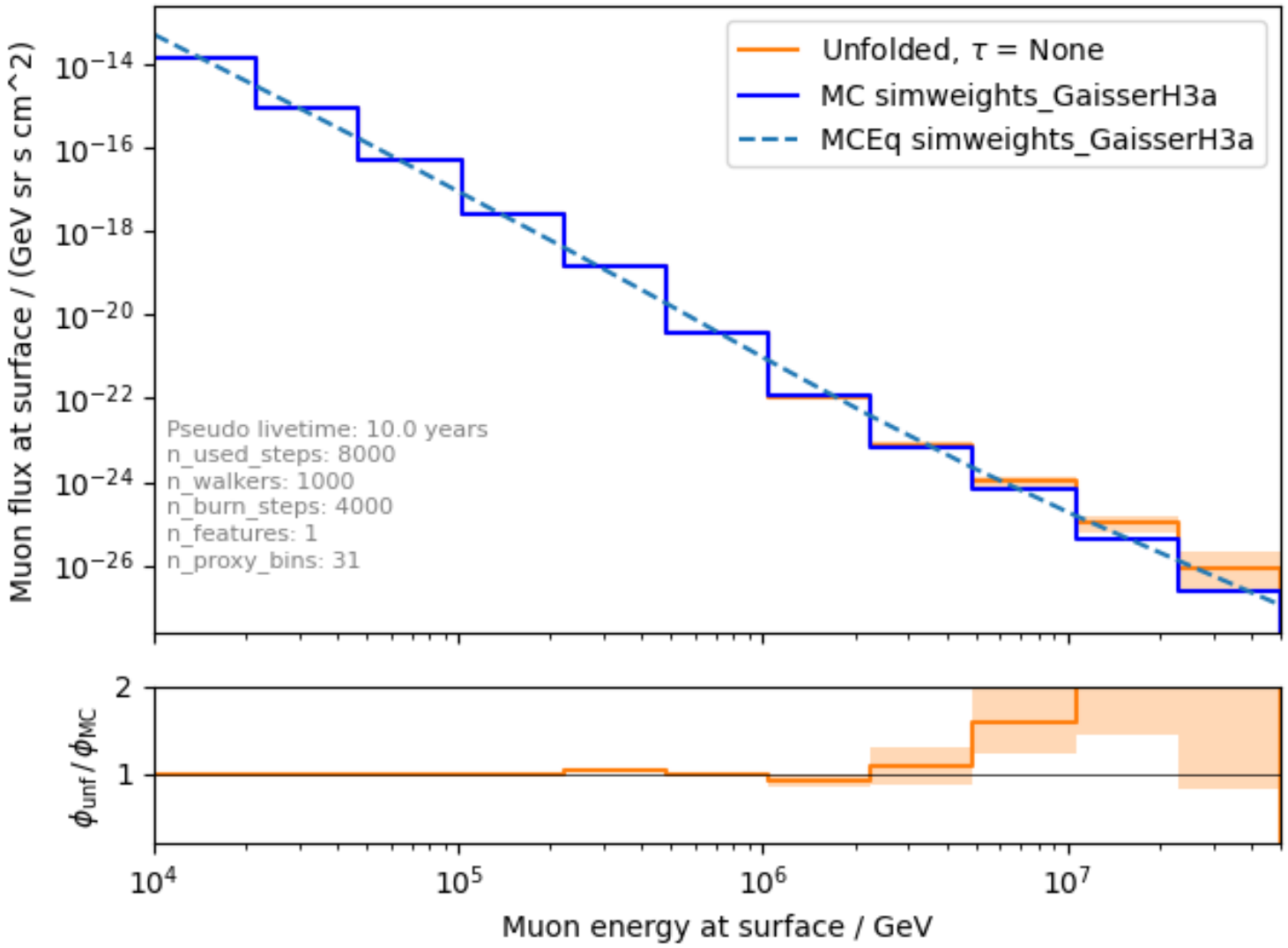
Conv

211: pi+
321: K+
130: K(L)0
310: K(S)0
13: mu-

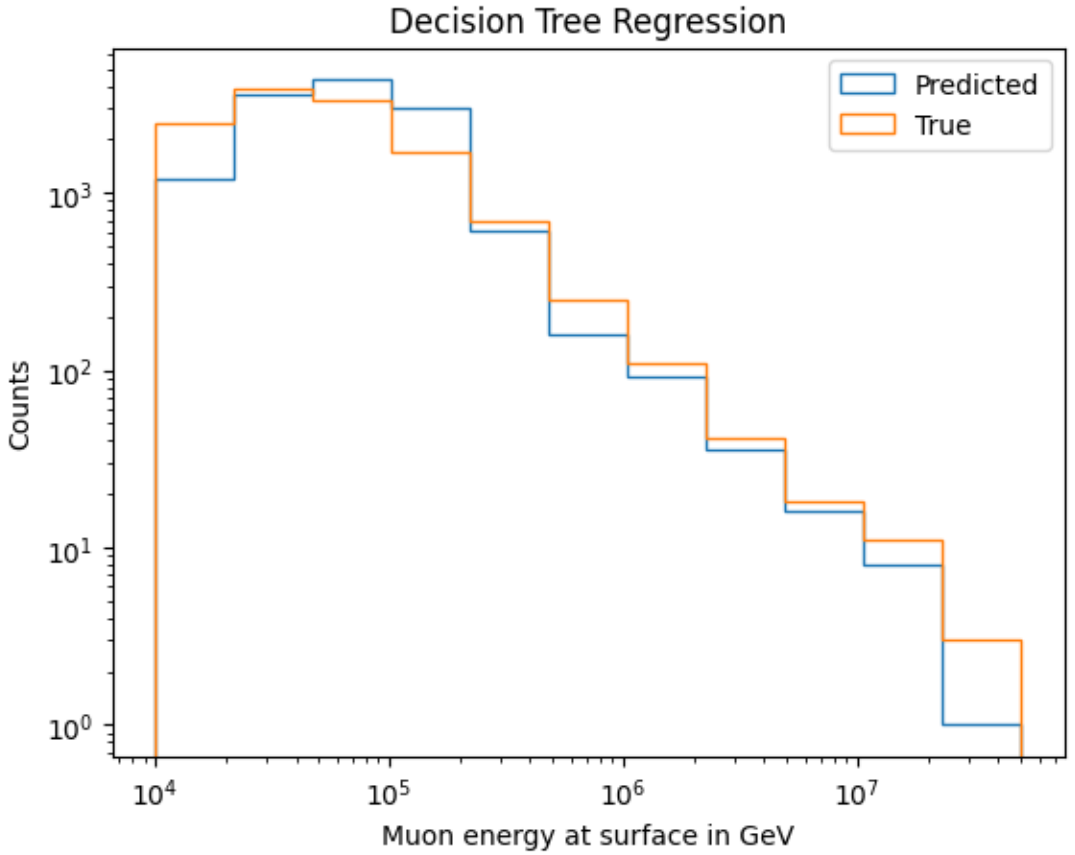


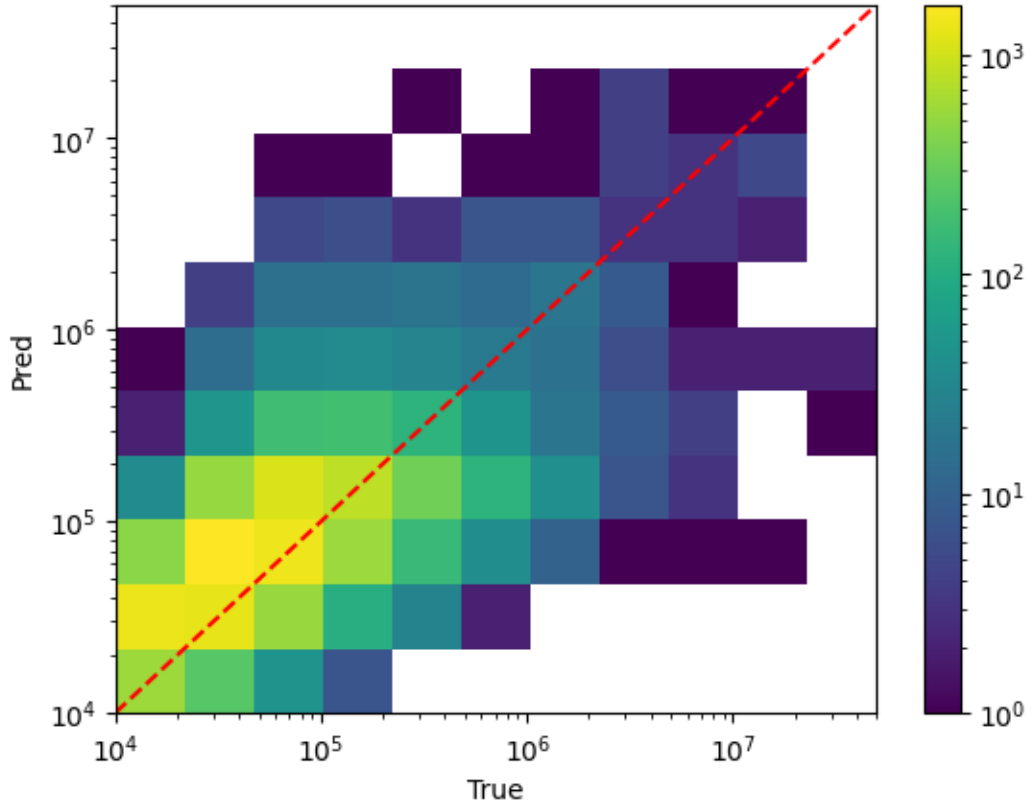
Unfolded muon flux at surface

- unfolding of the high energy region above ~1 PeV depends on the flux model
- several orders of magnitude are reconstructed → too less statistics at high energies
- reweight events to get more statistics at high energies for training

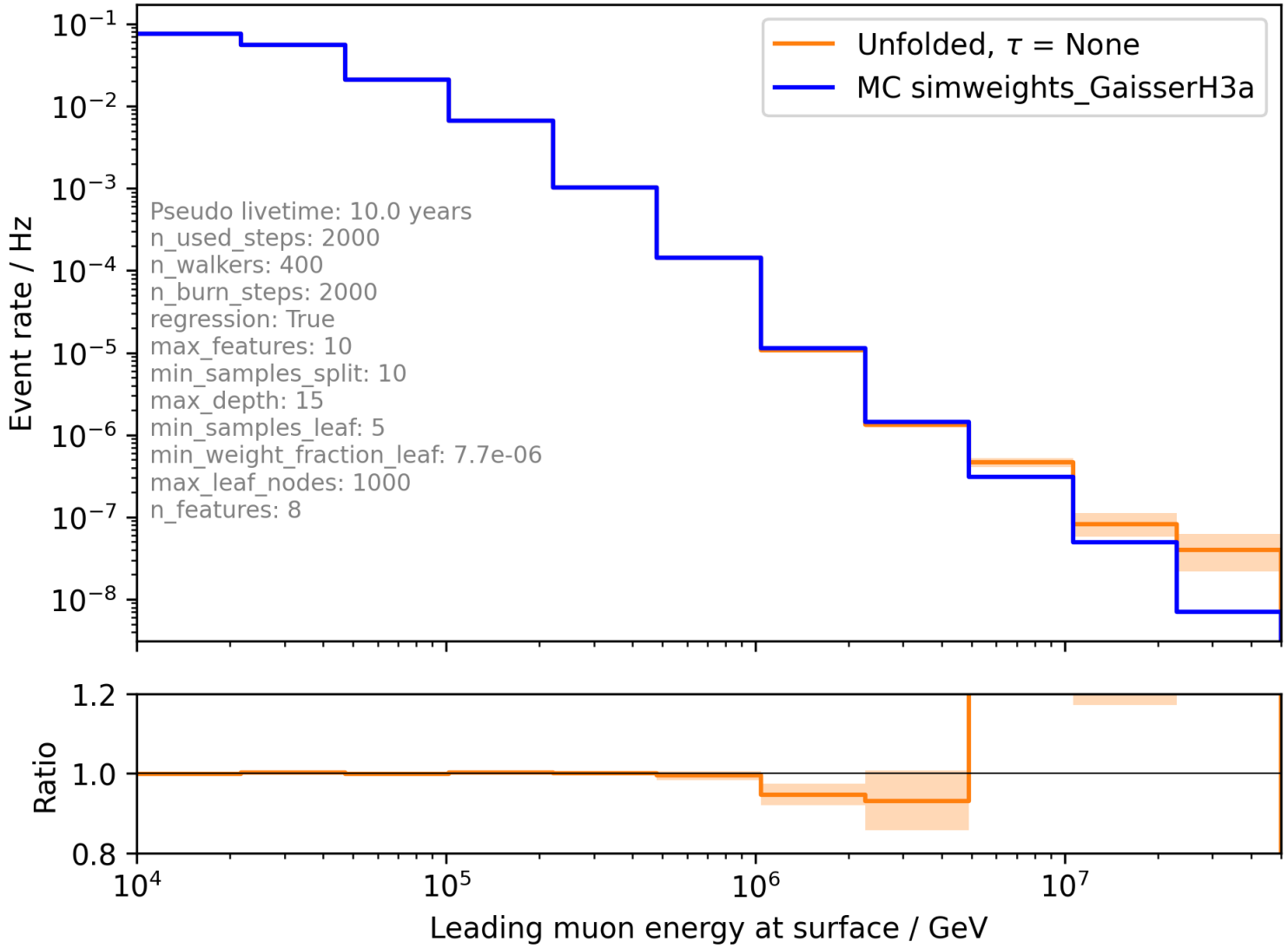


Tree binning – check tree prediction





Event rate using tree binning



Event rate using tree binning