

Spectral Analysis of M82 with Powerlaw and Exponentialcut-PowerLaw

Parameters provided:

Index = 2.22

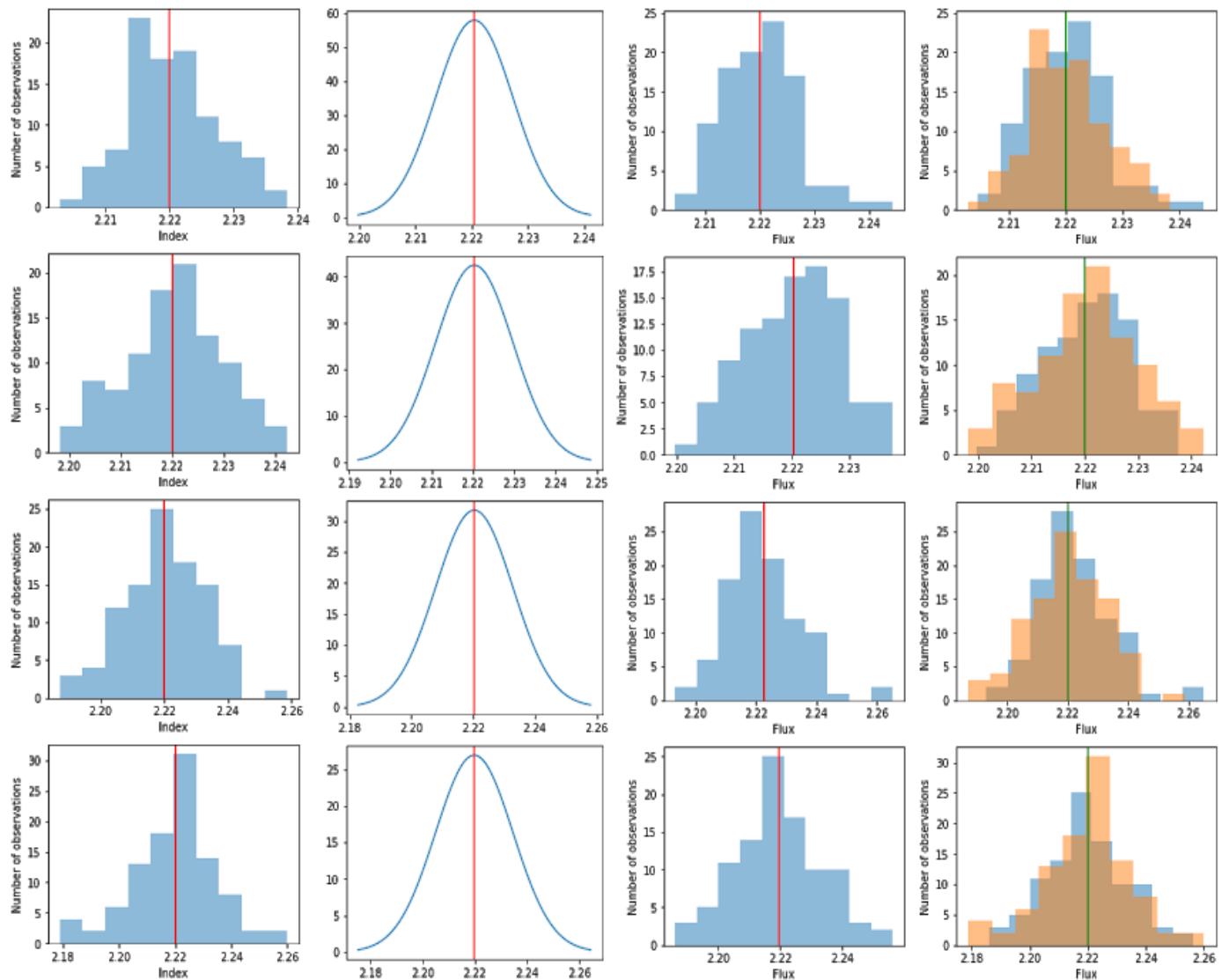
Amplitude = 1.289e-12

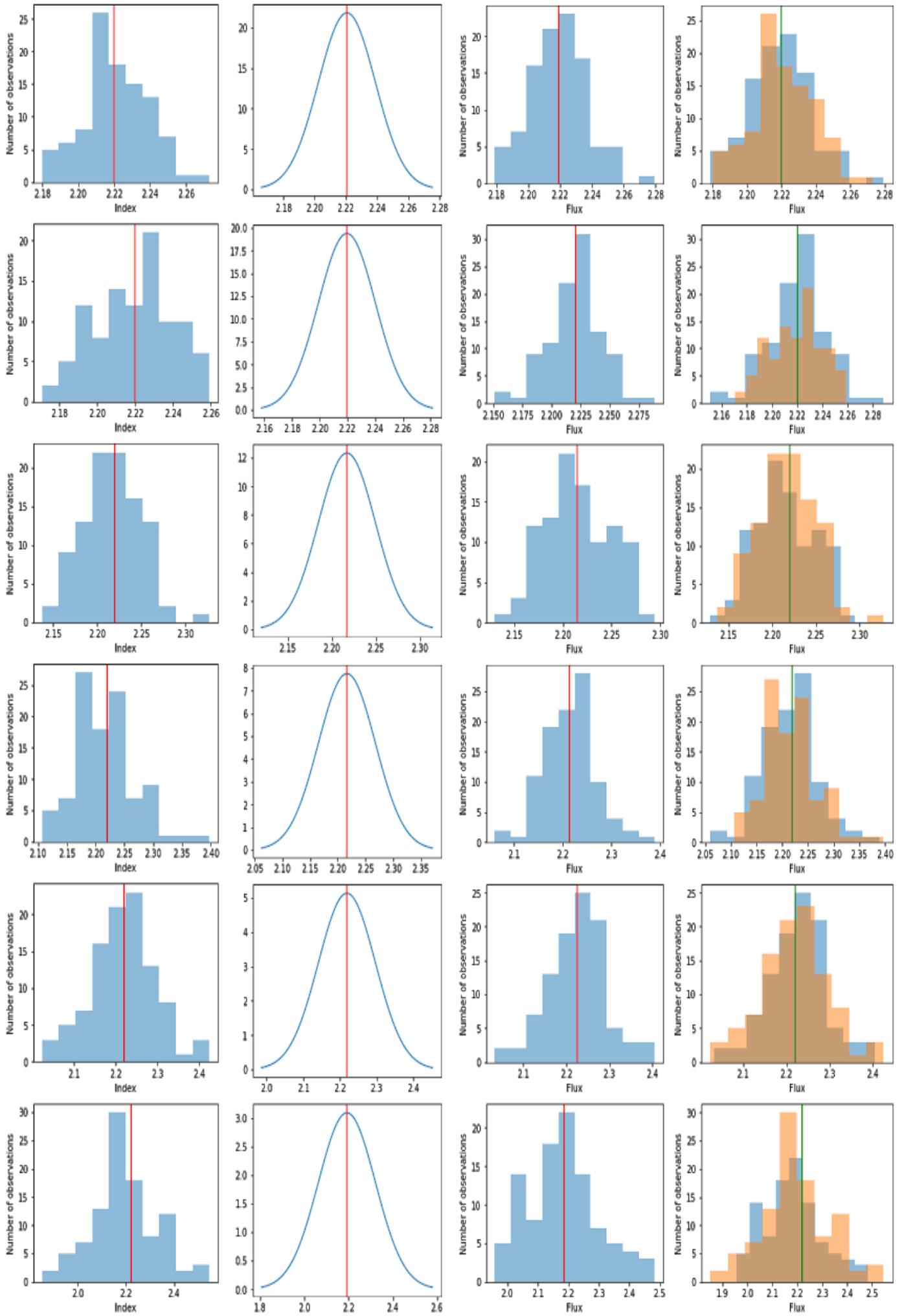
Runtime = 48hrs

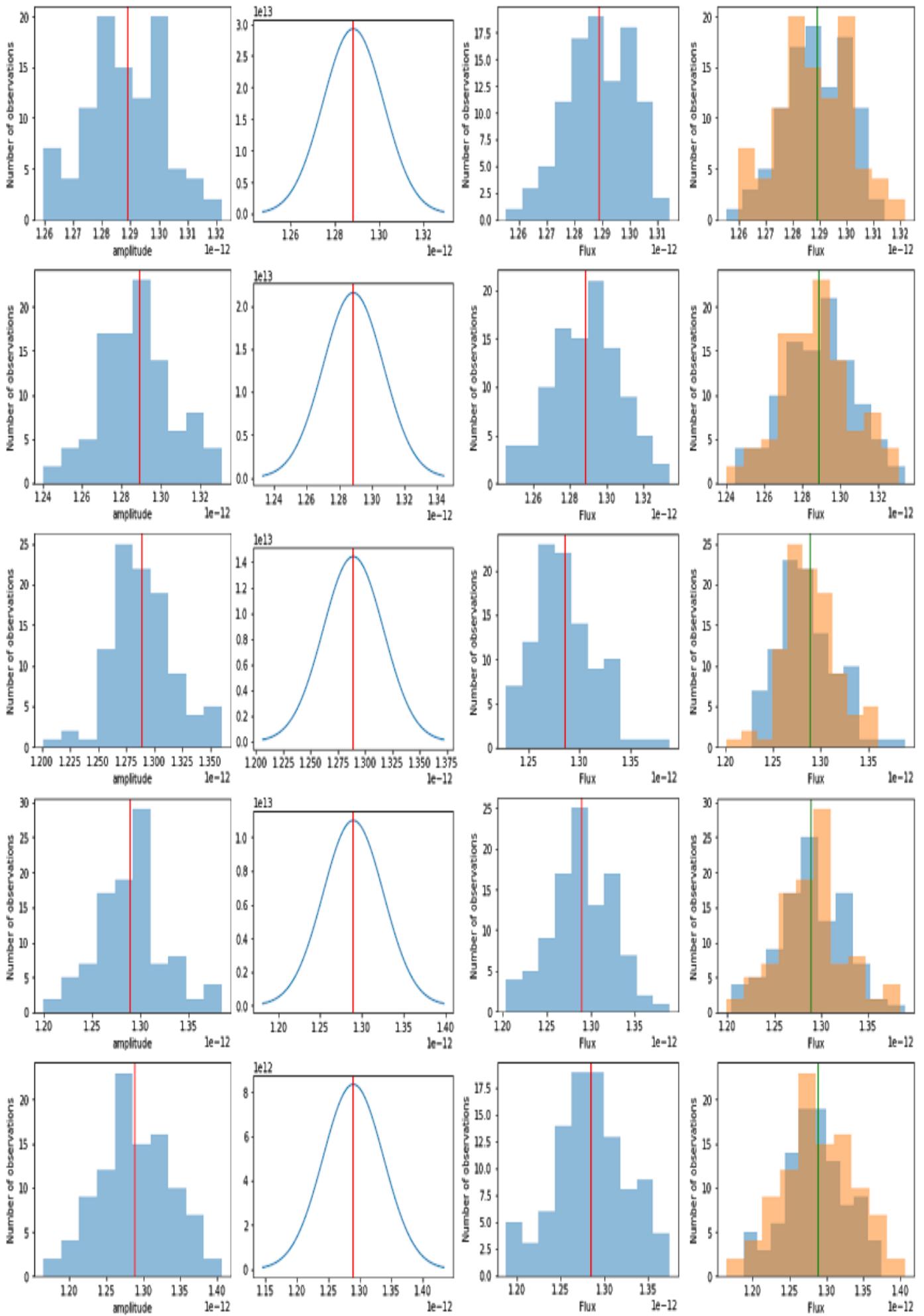
Energy Range = 30GeV - 100Tev

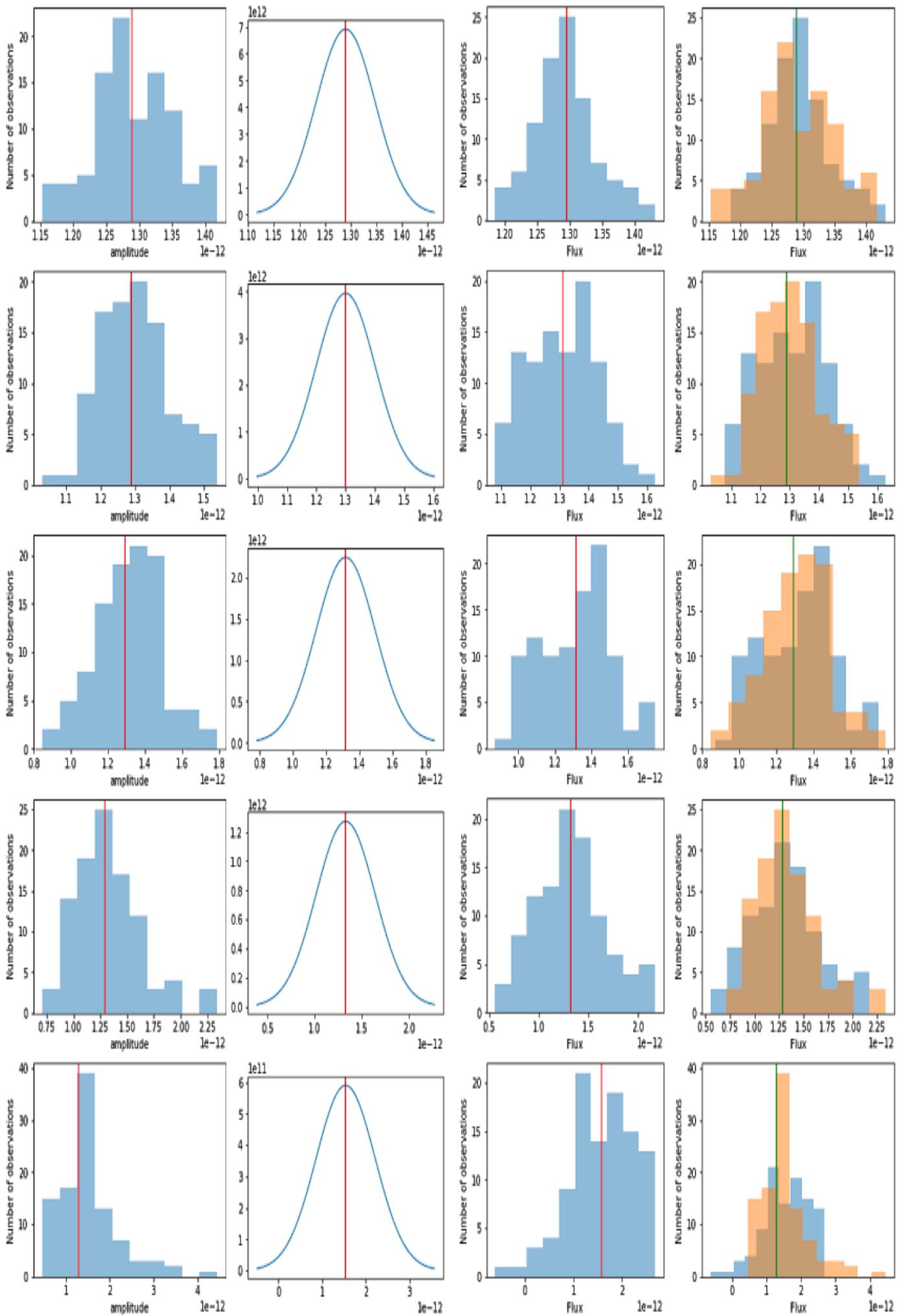
Analysis with different number of observations:

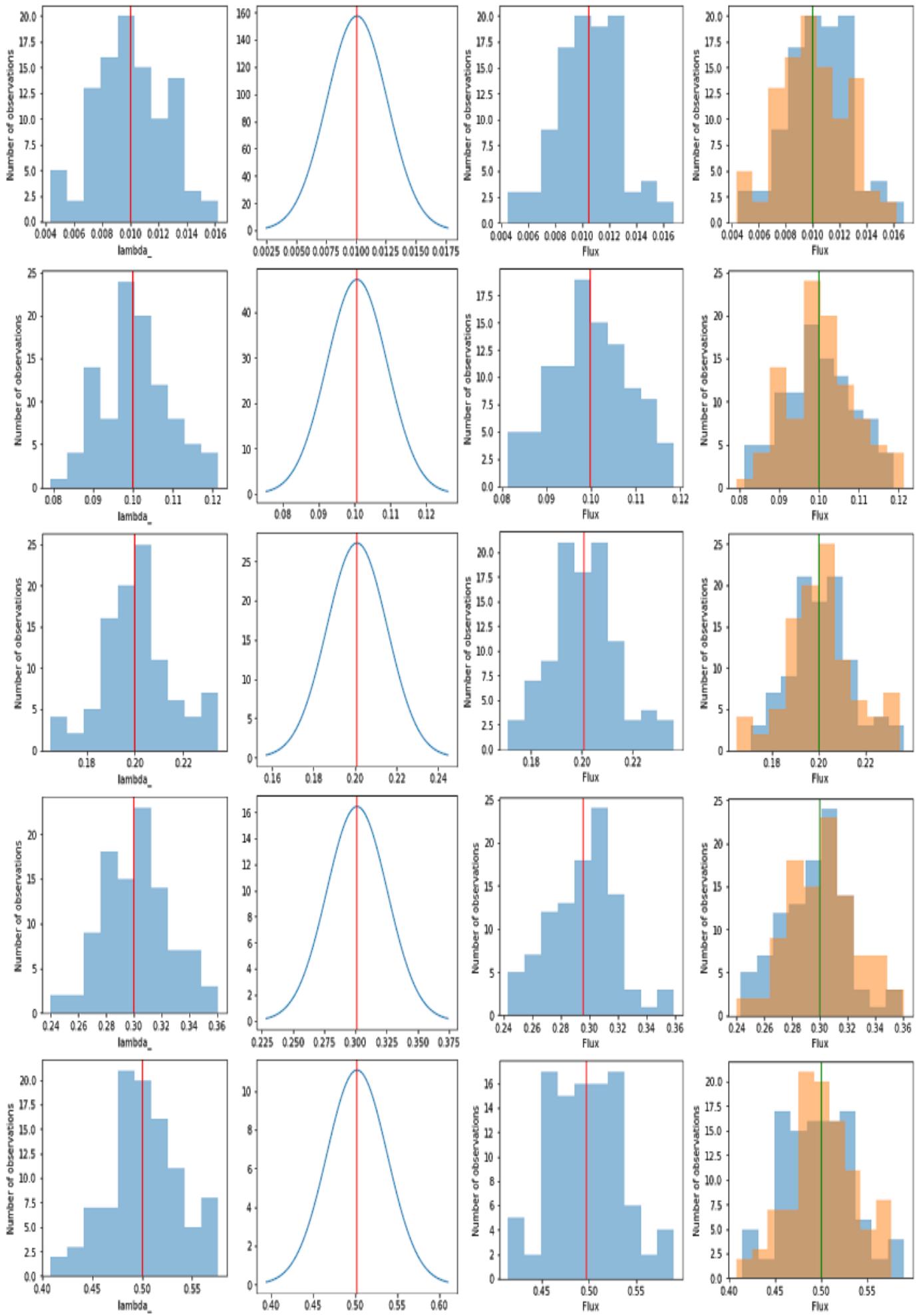
N = 100

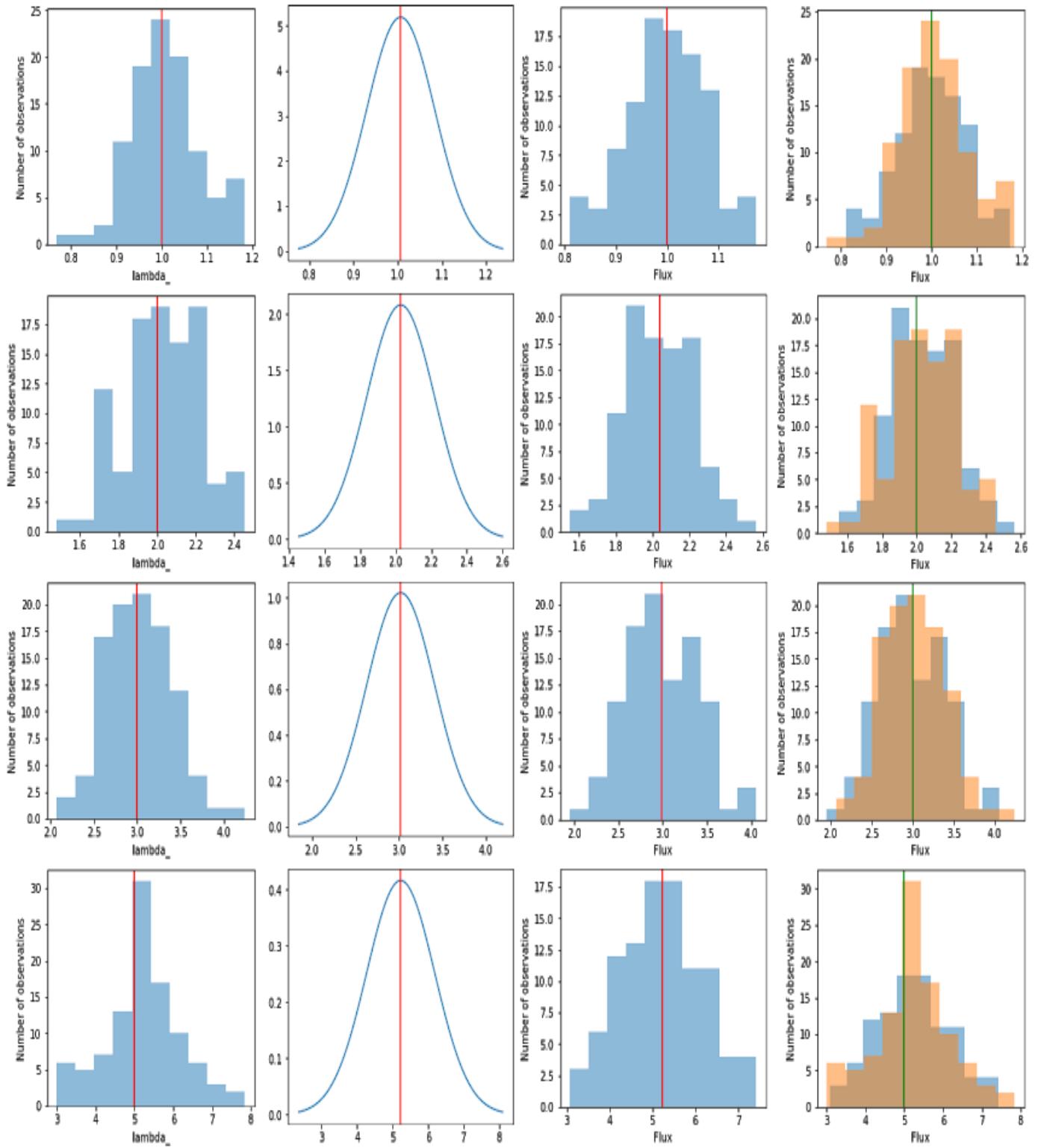










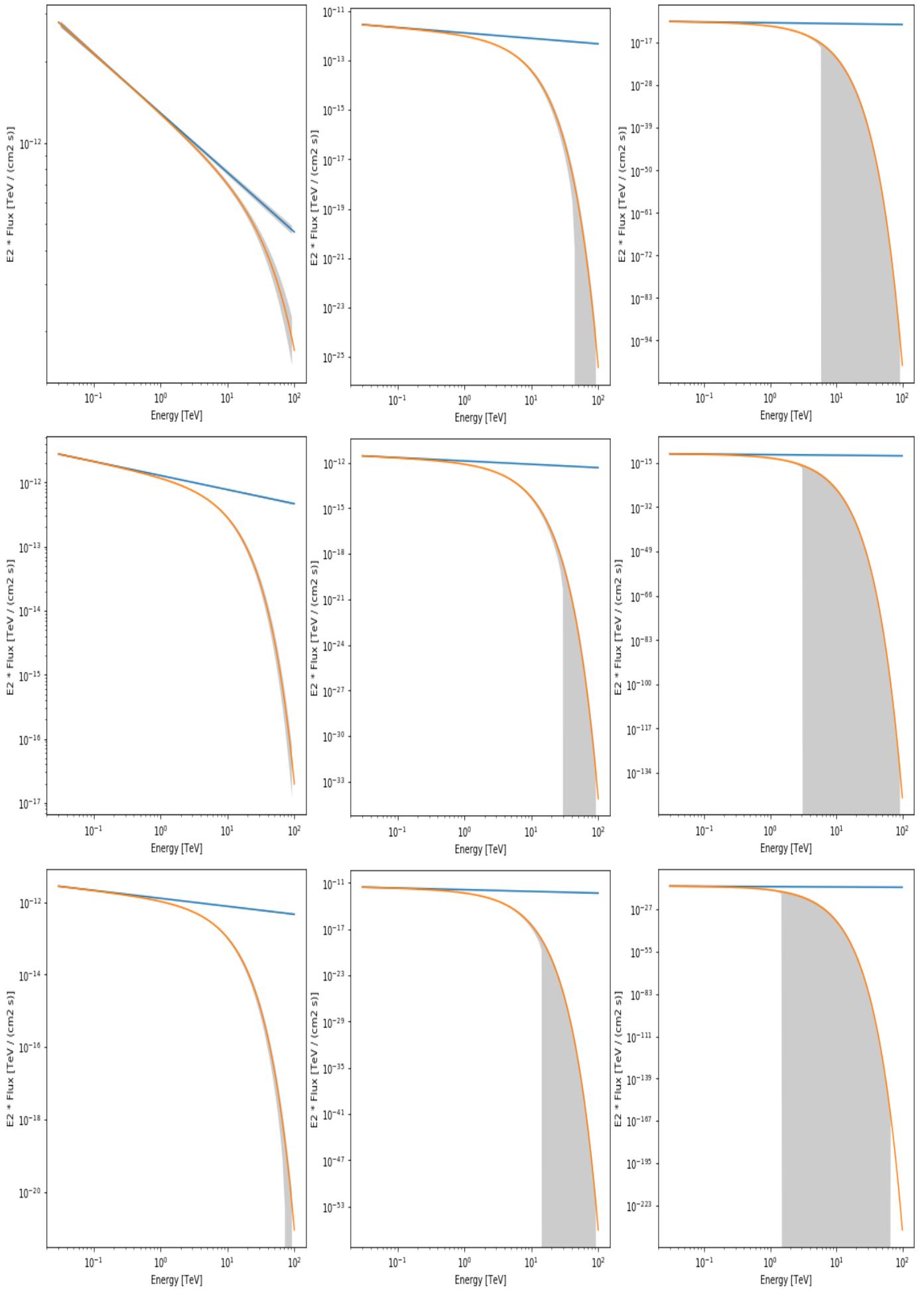


Going down in images we get Index, amplitude and lambda variations. Index and Amplitude have 10 images as of PowerLaw model and 9 Exponentialcut-Powerlaw models with Lambda values (0.01, 0.1, 0.2, 0.3, 0.5, 1, 2, 3, 5).

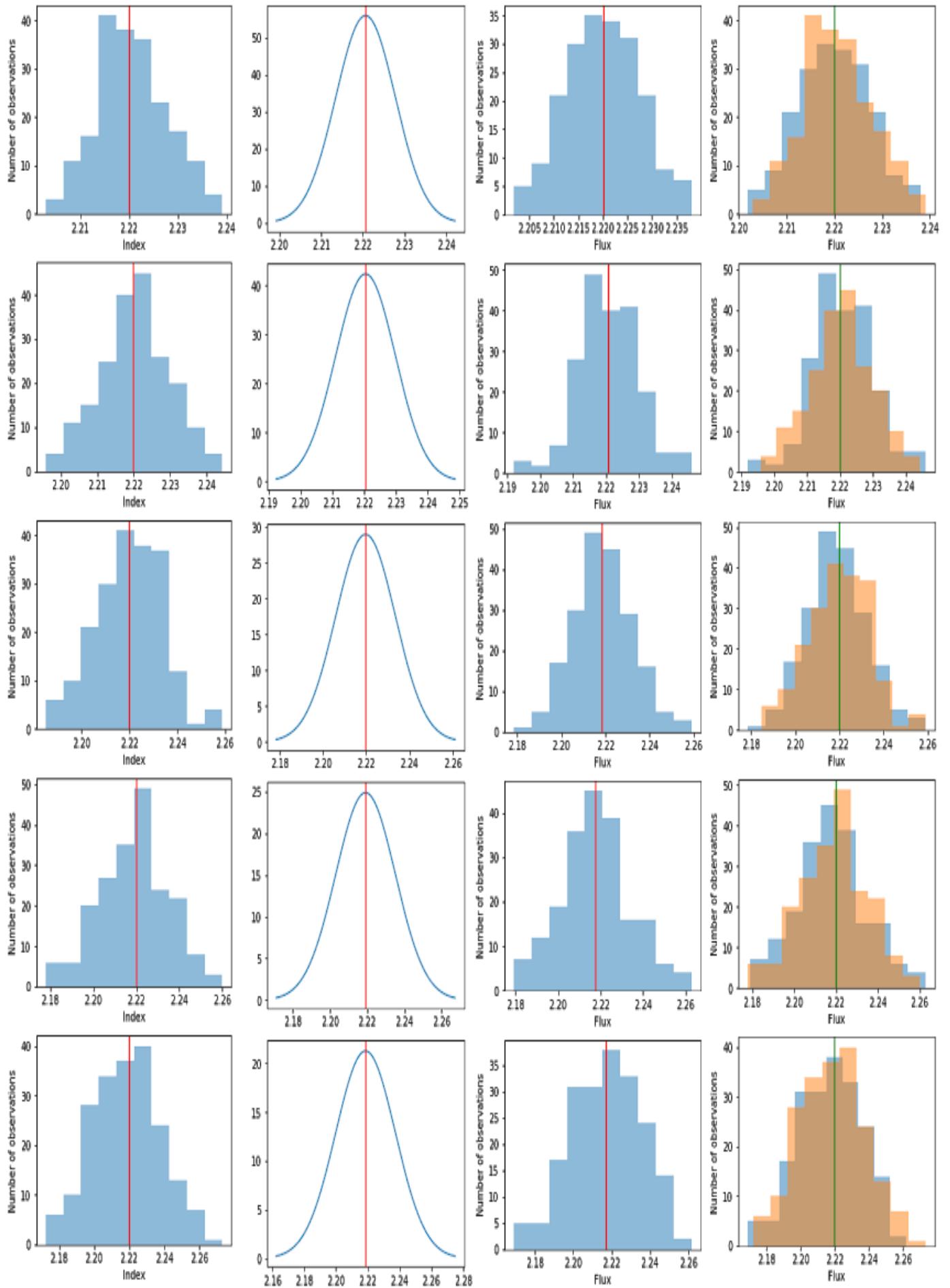
Going sideways we get 4 images.

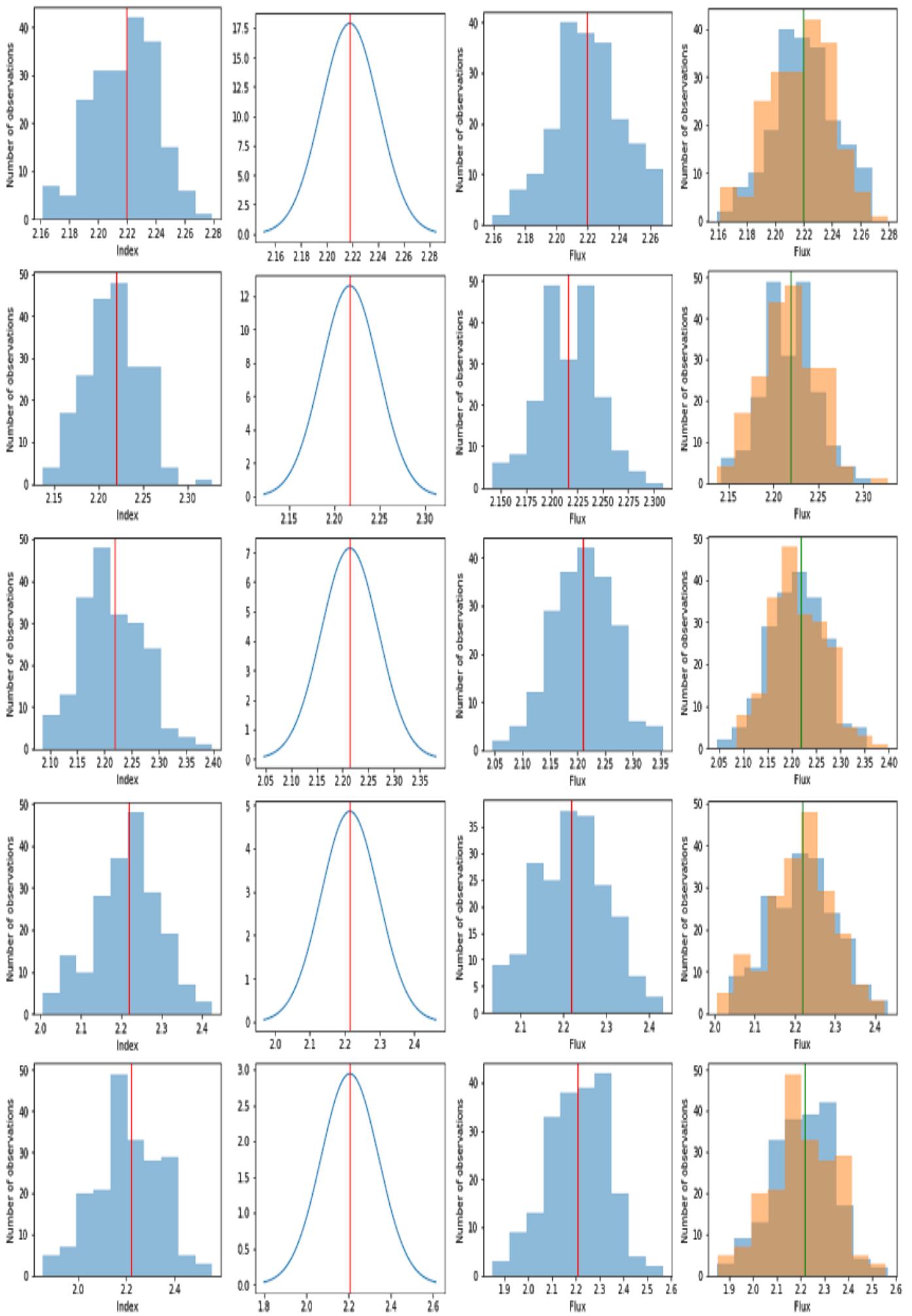
1. Histogram of n observations
2. Gaussian reconstruction with Mean and Standard deviation
3. Gaussian histogram reconstruction with obtained Mean and Standard deviation
4. Simultaneous comparison of both histograms.

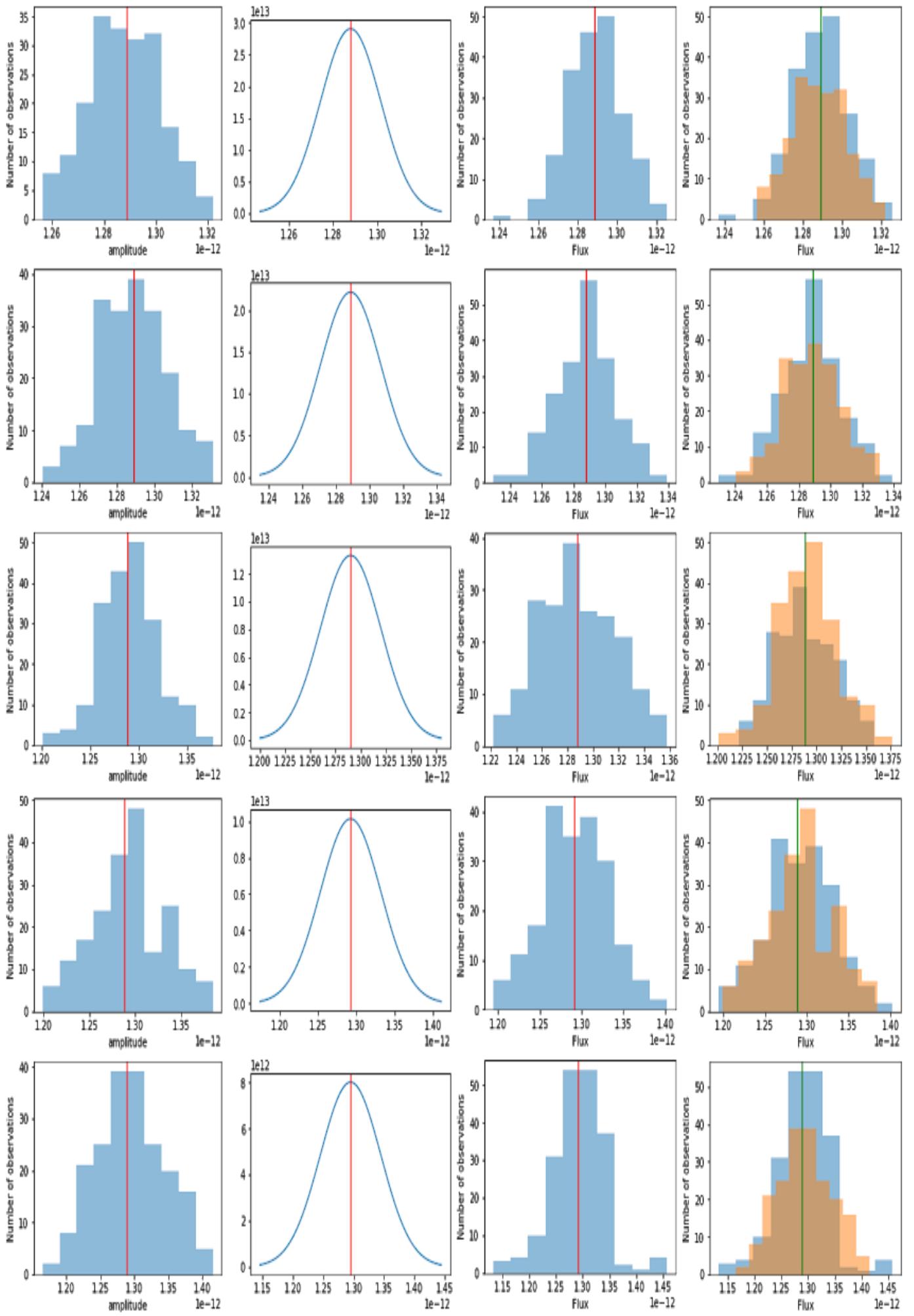
Plots of exponentialcut-powerlaw(with different l) in comparison with powerlaw along with errors.

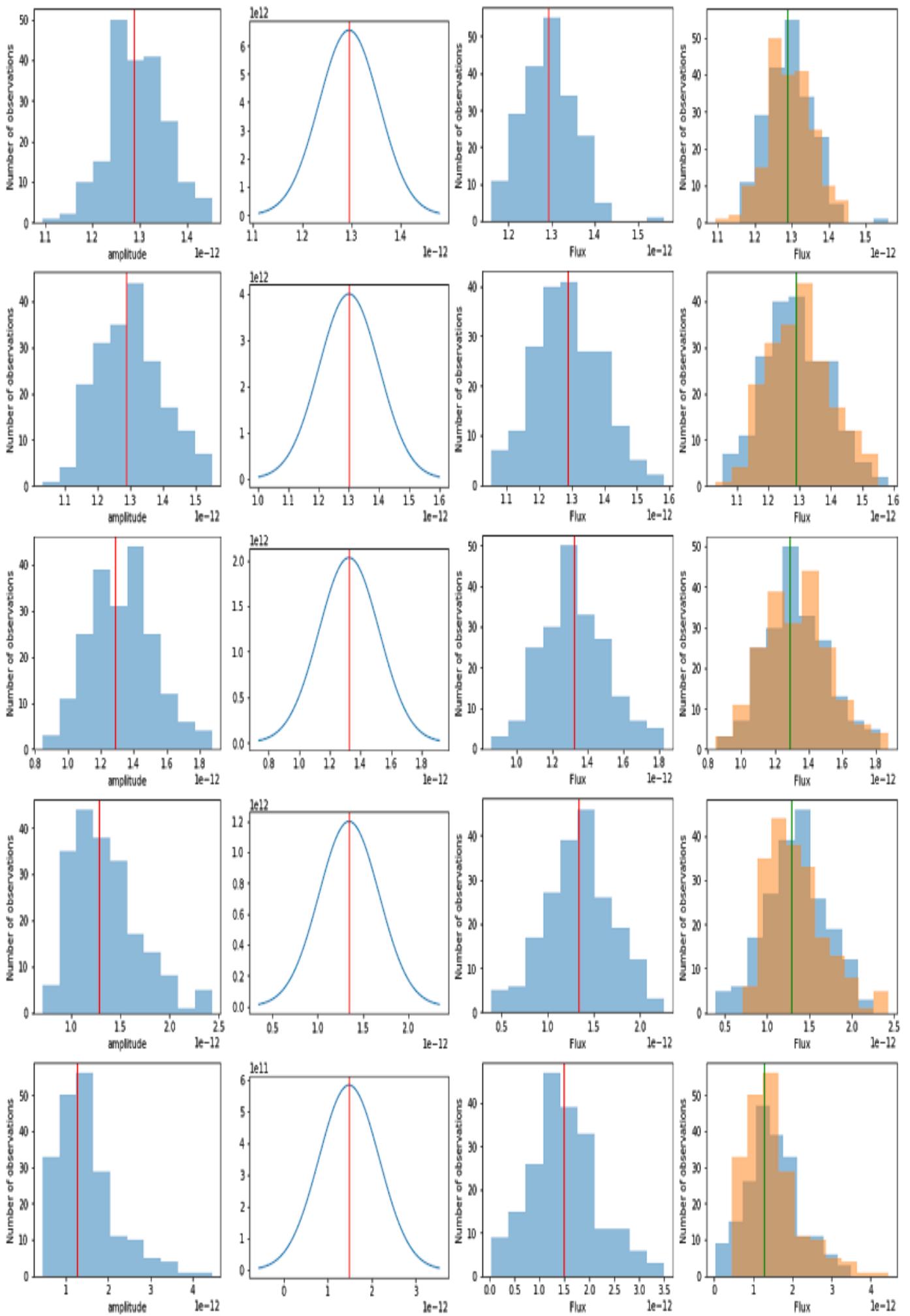


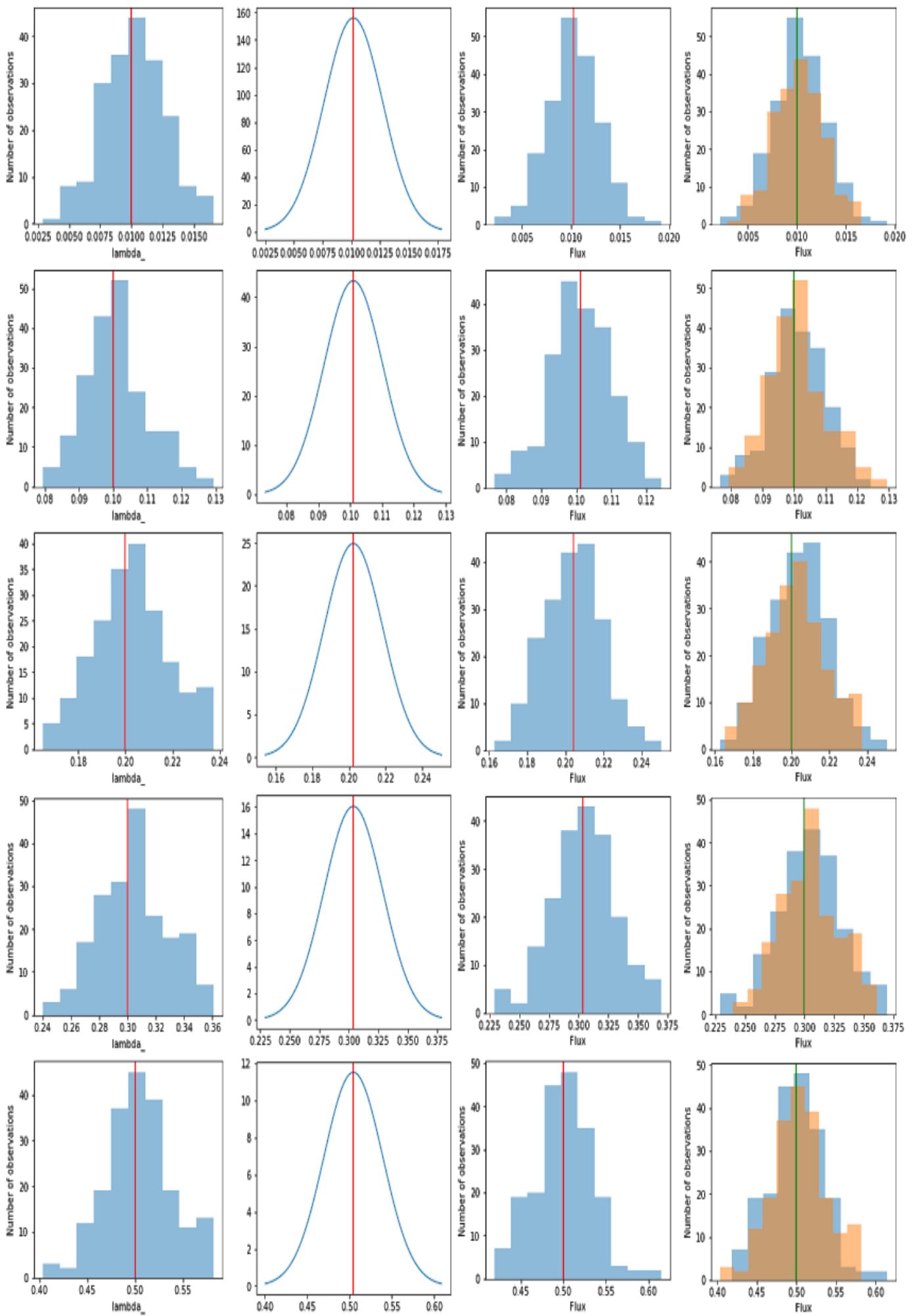
$N = 200$

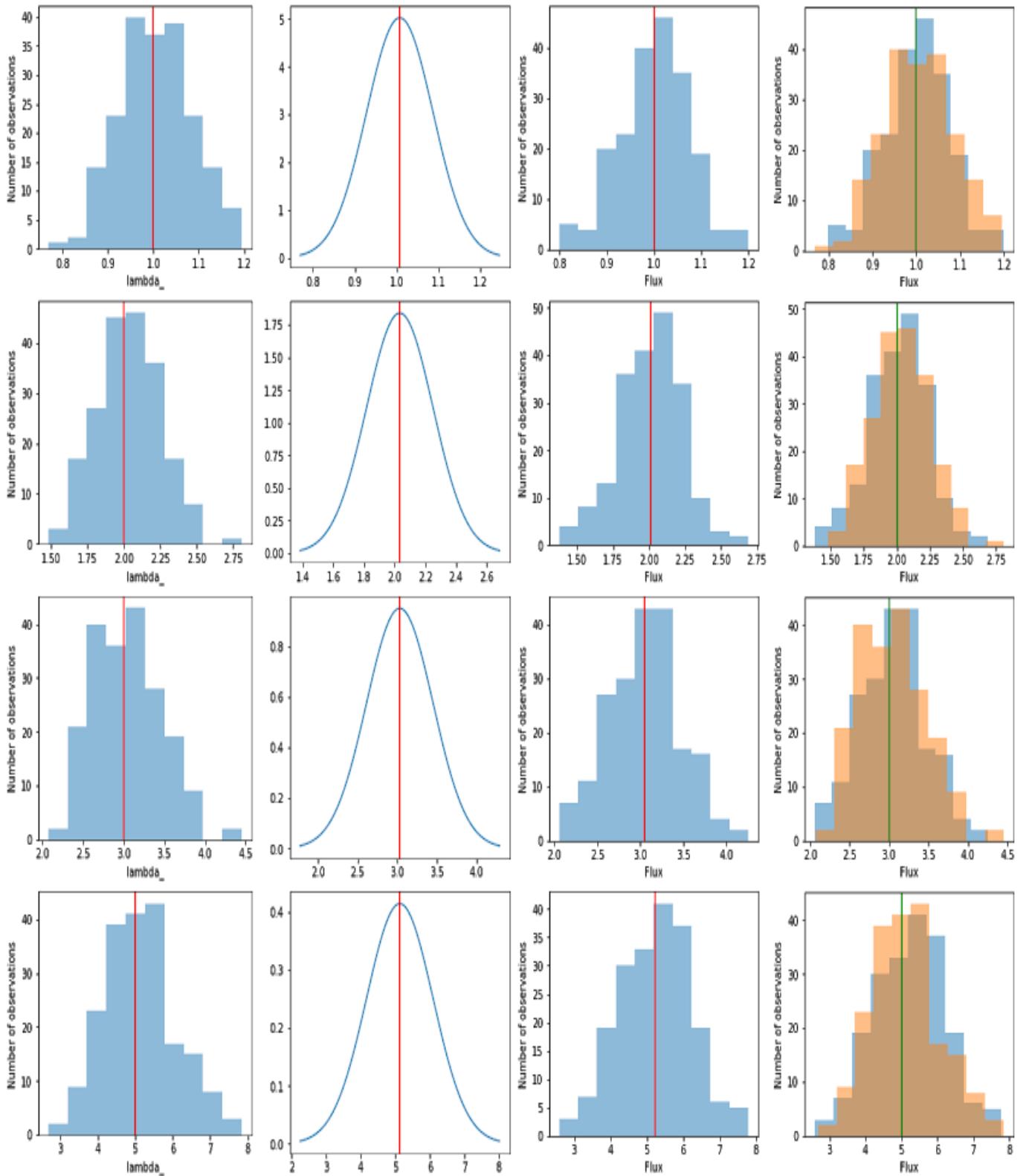


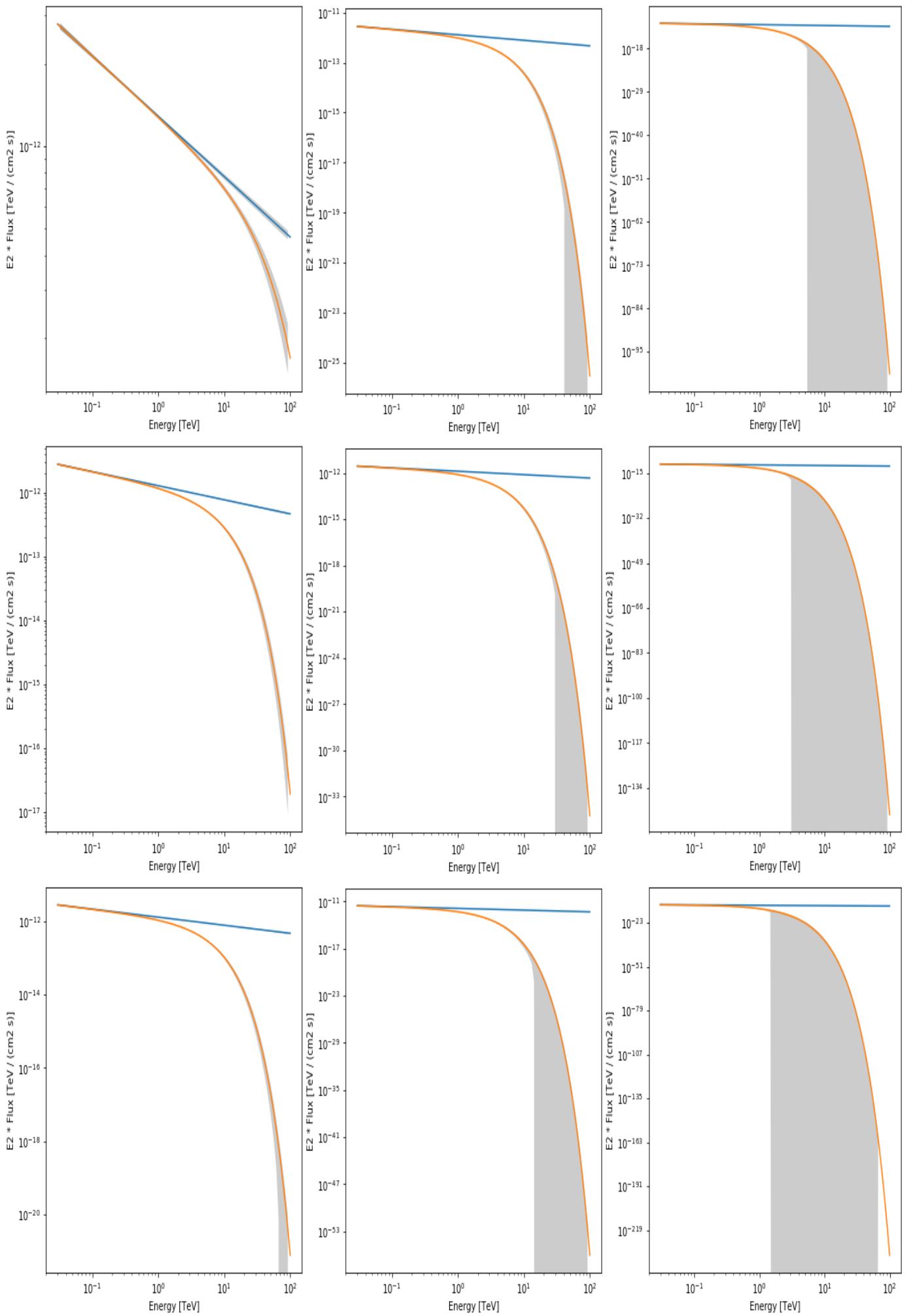




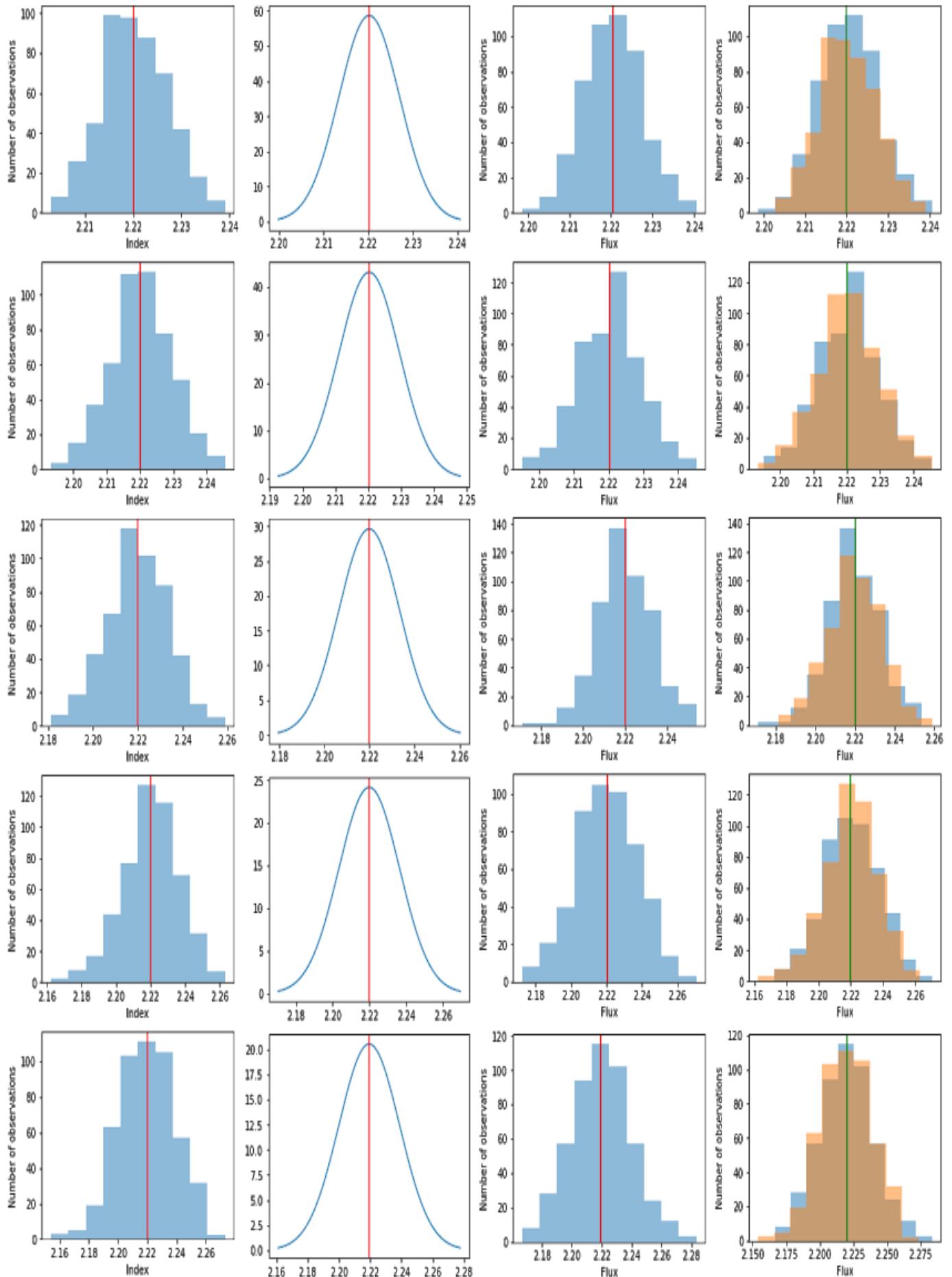


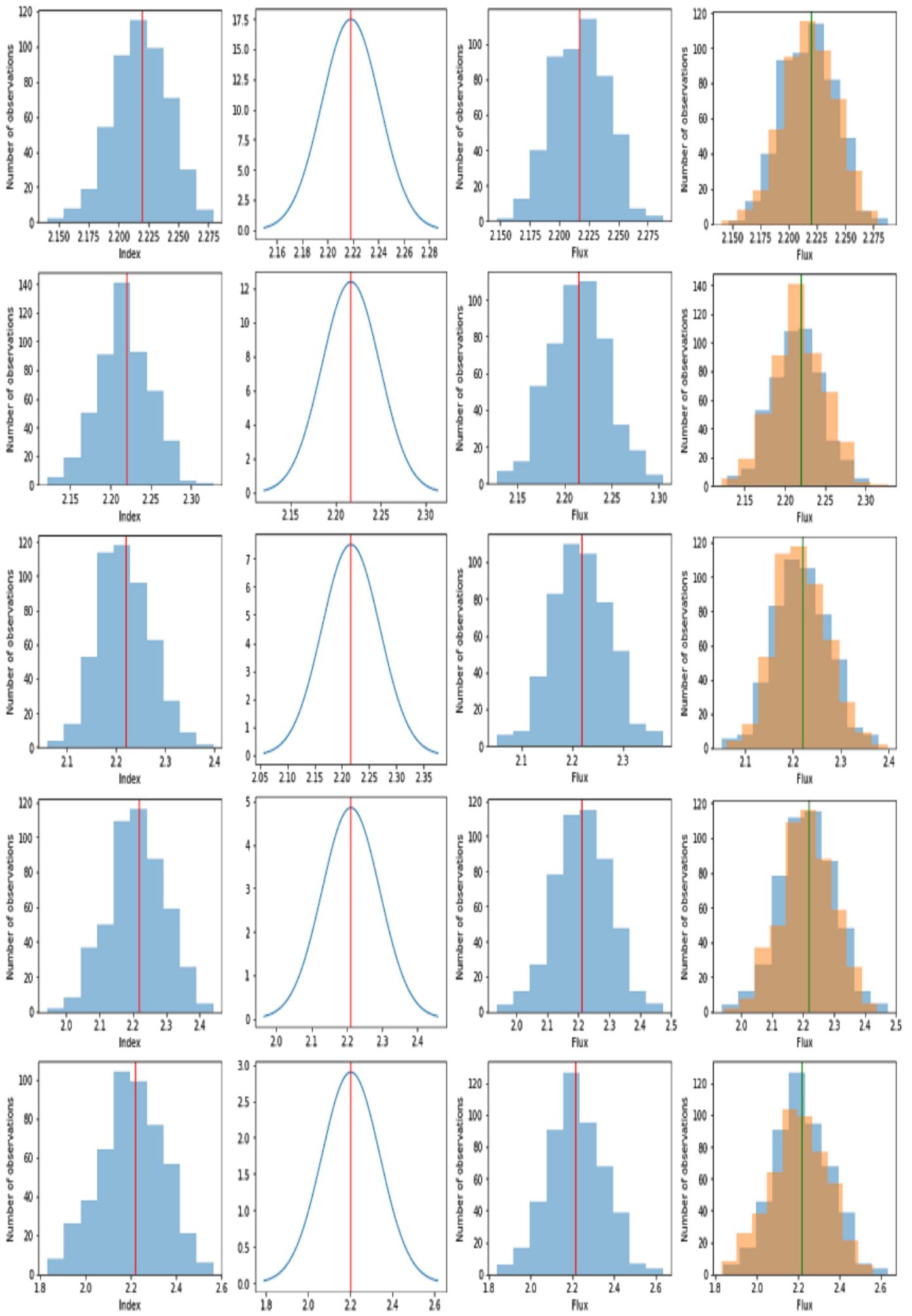


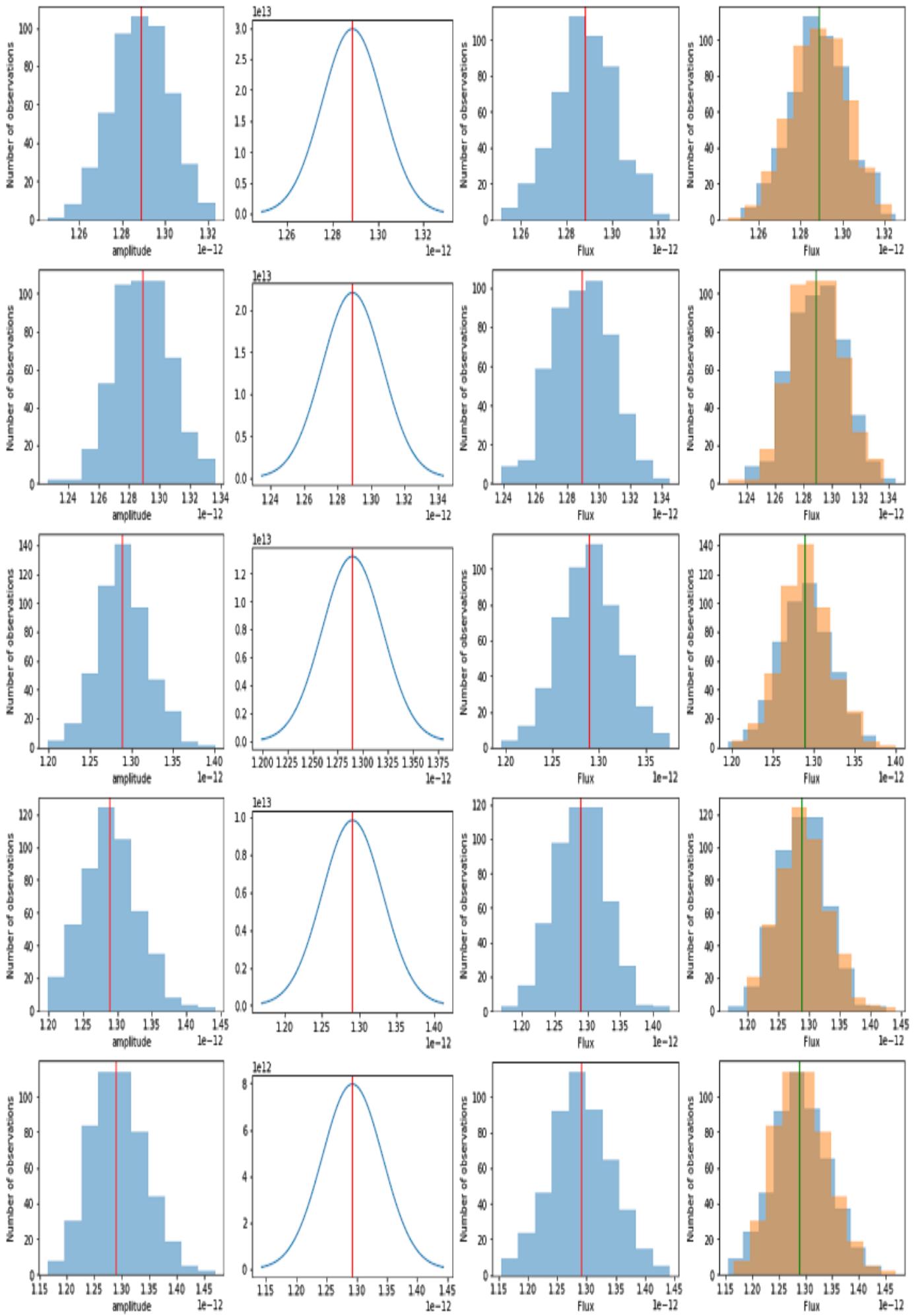


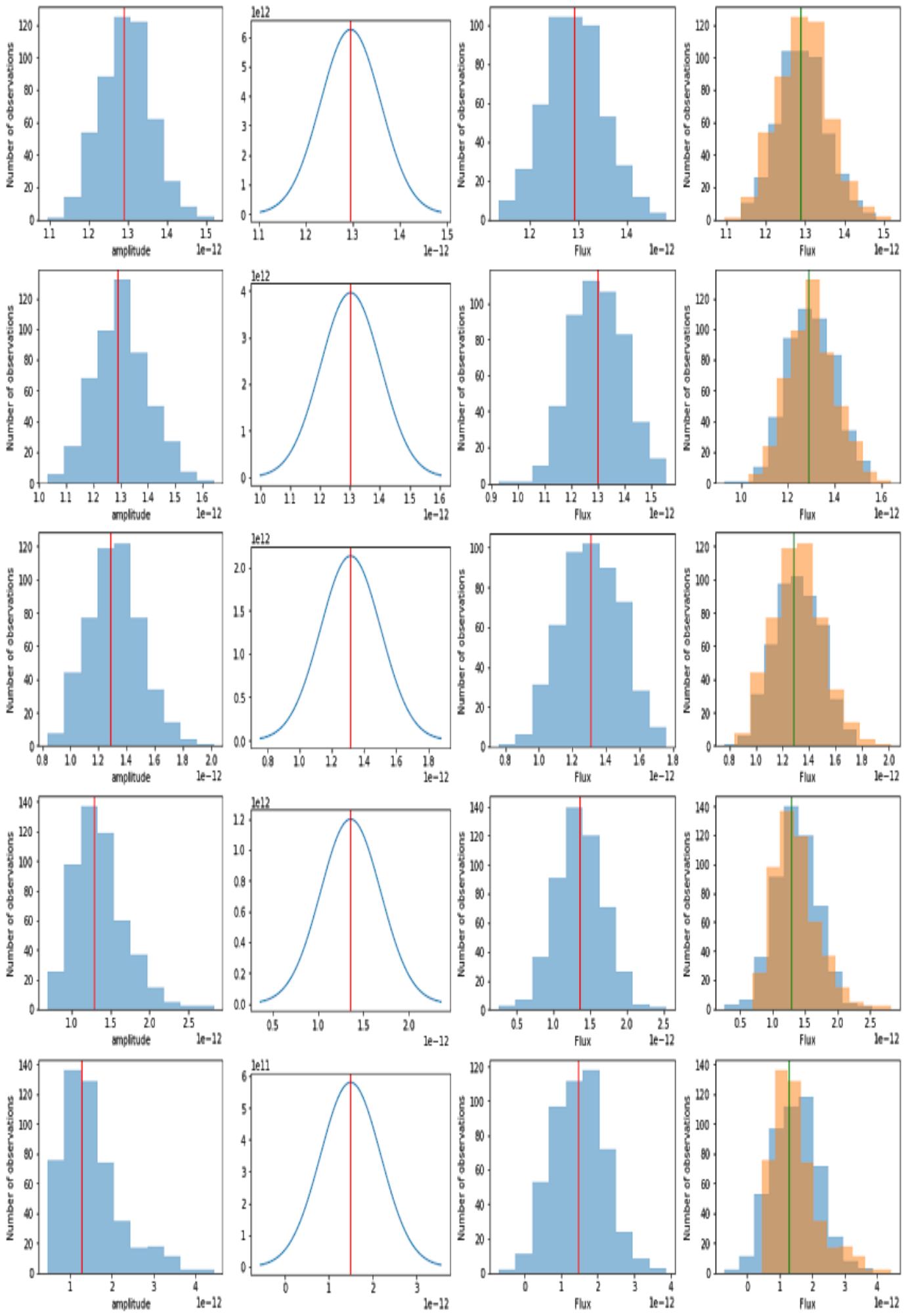


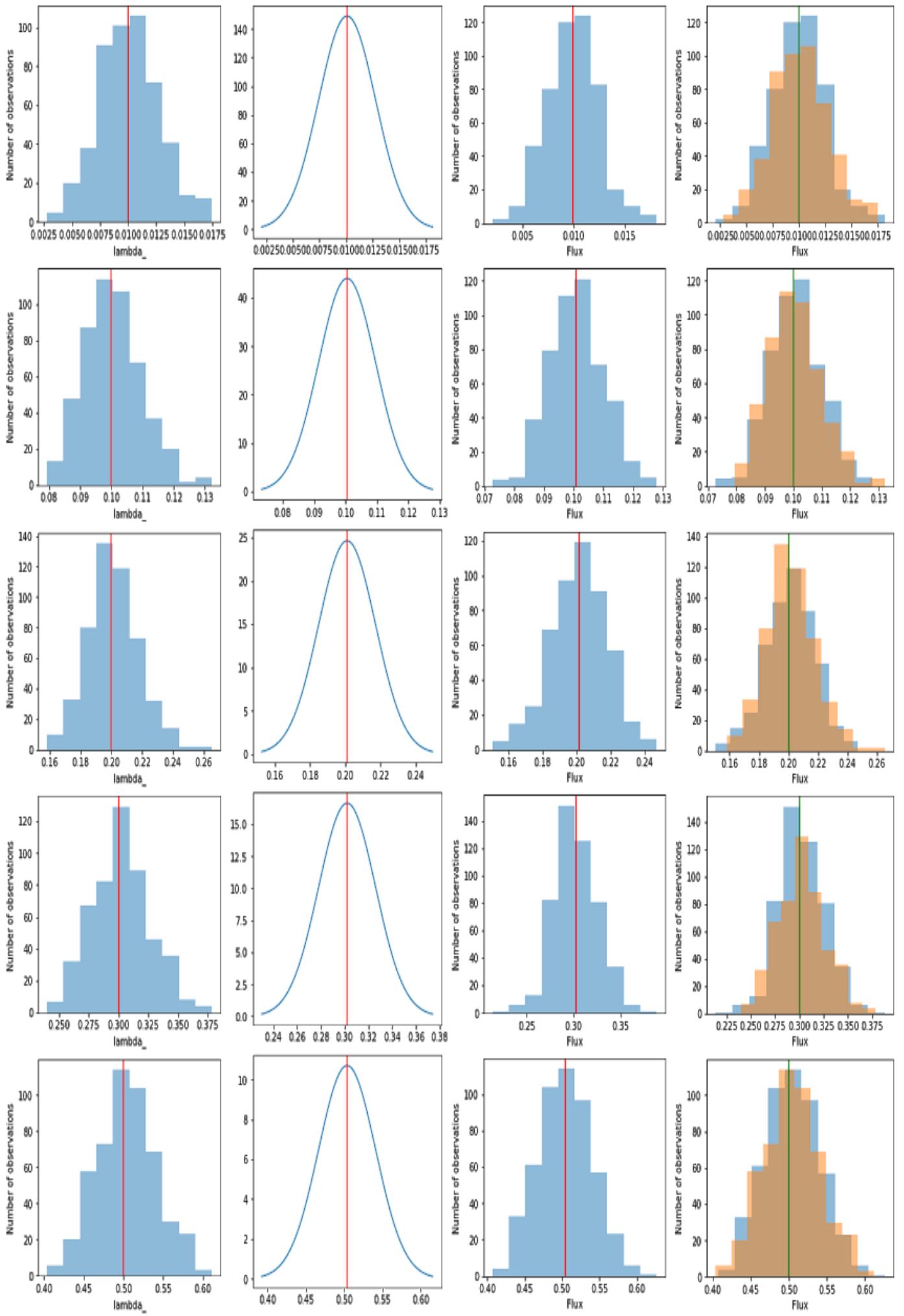
$N = 500$

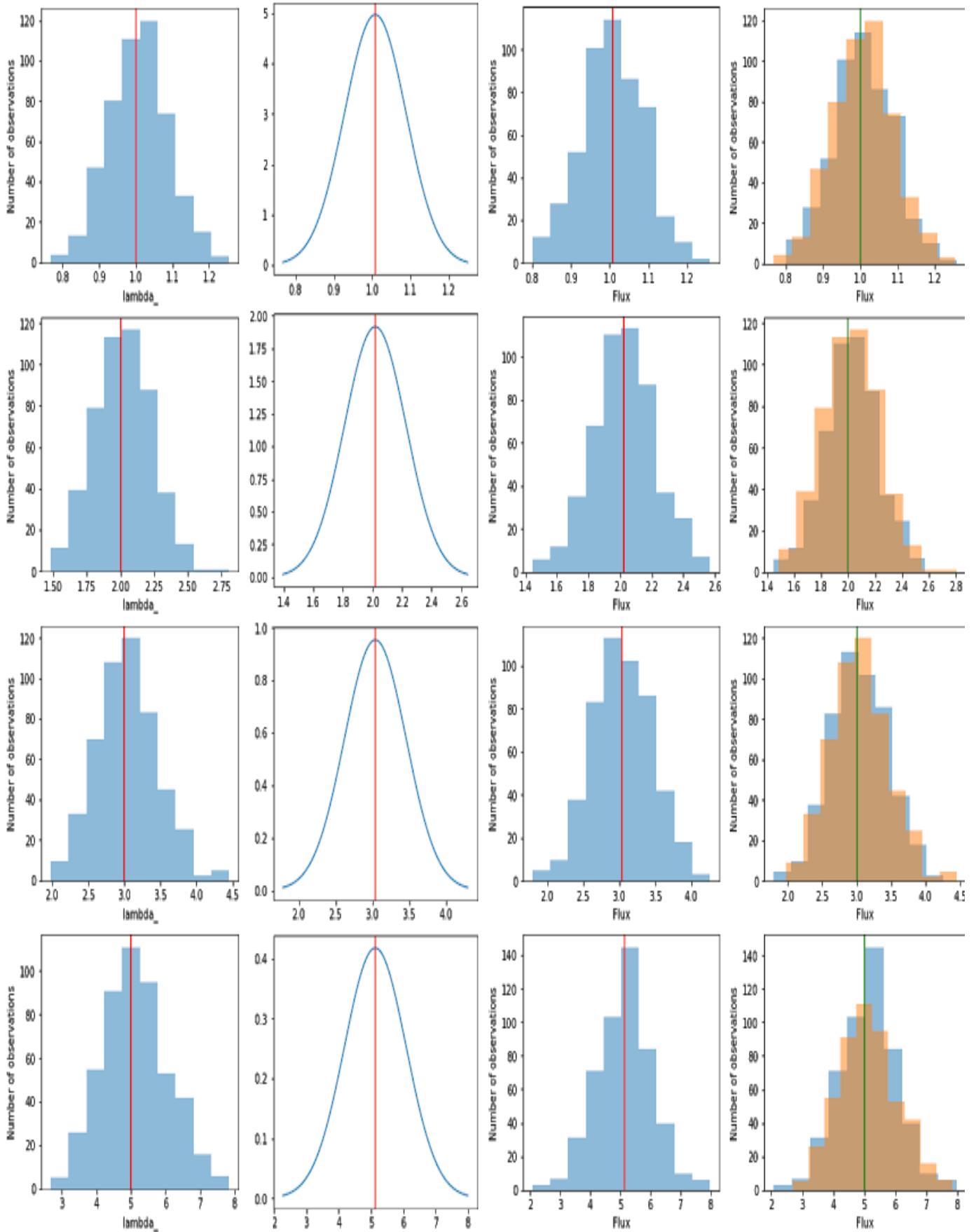


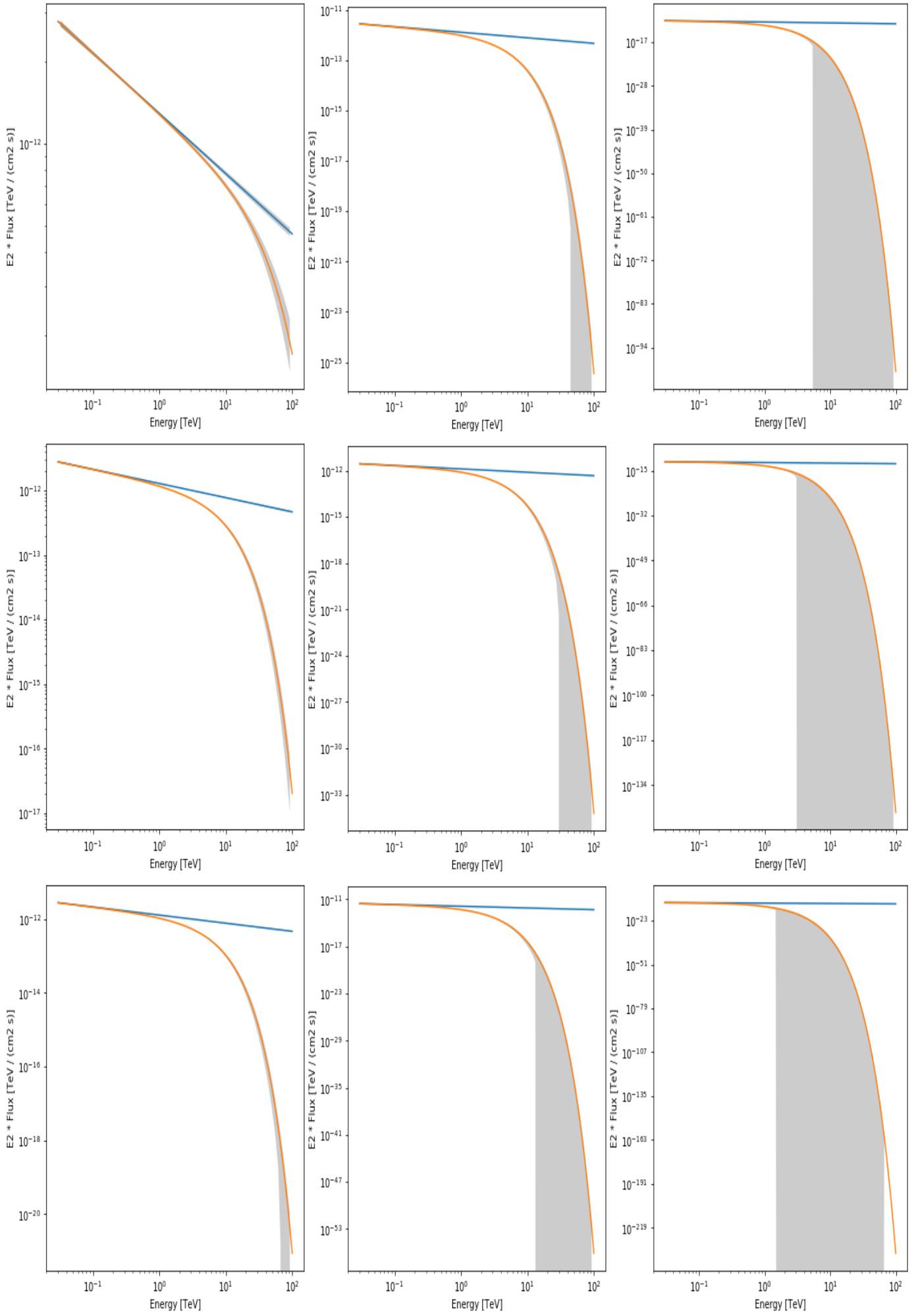




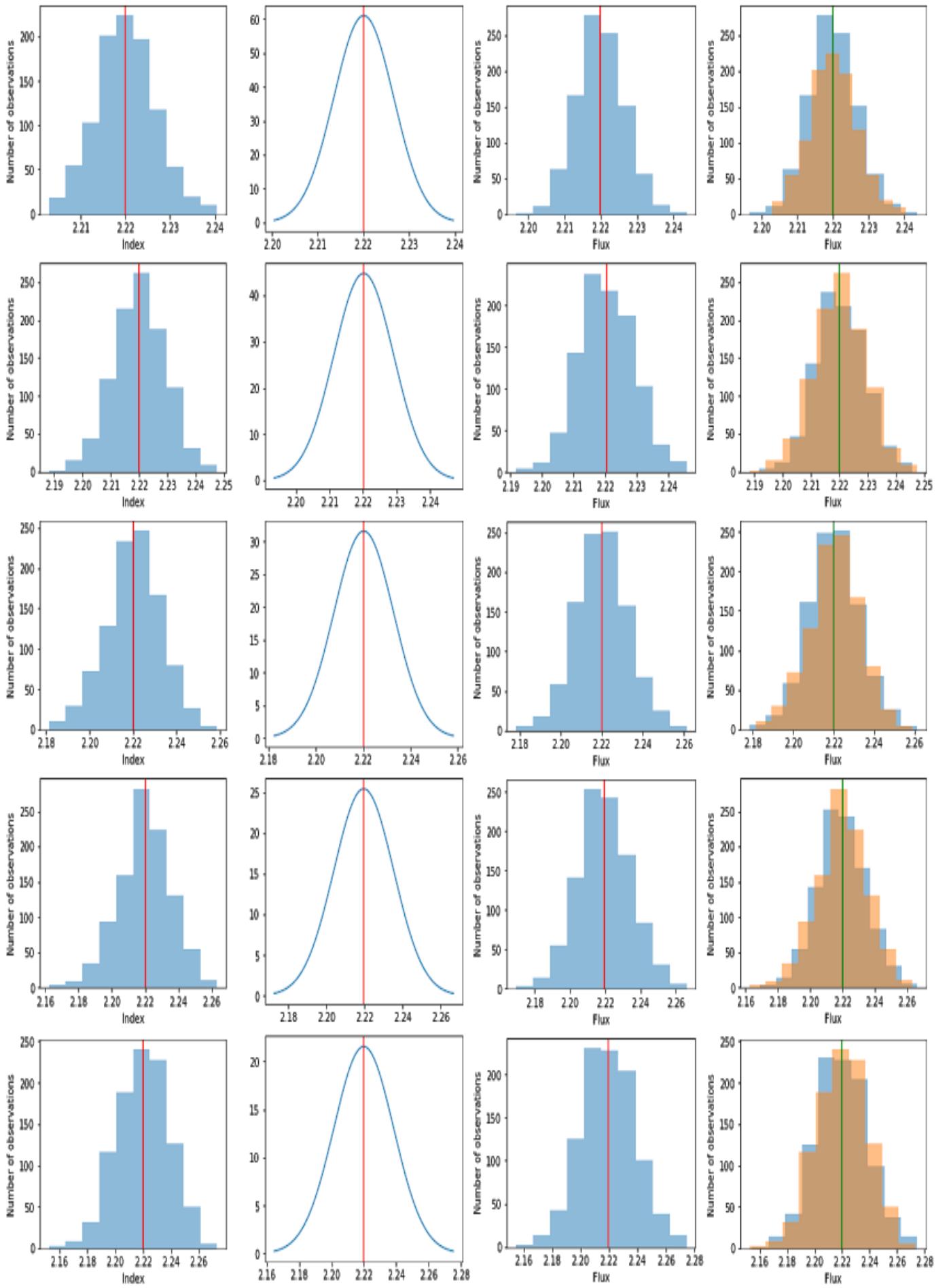


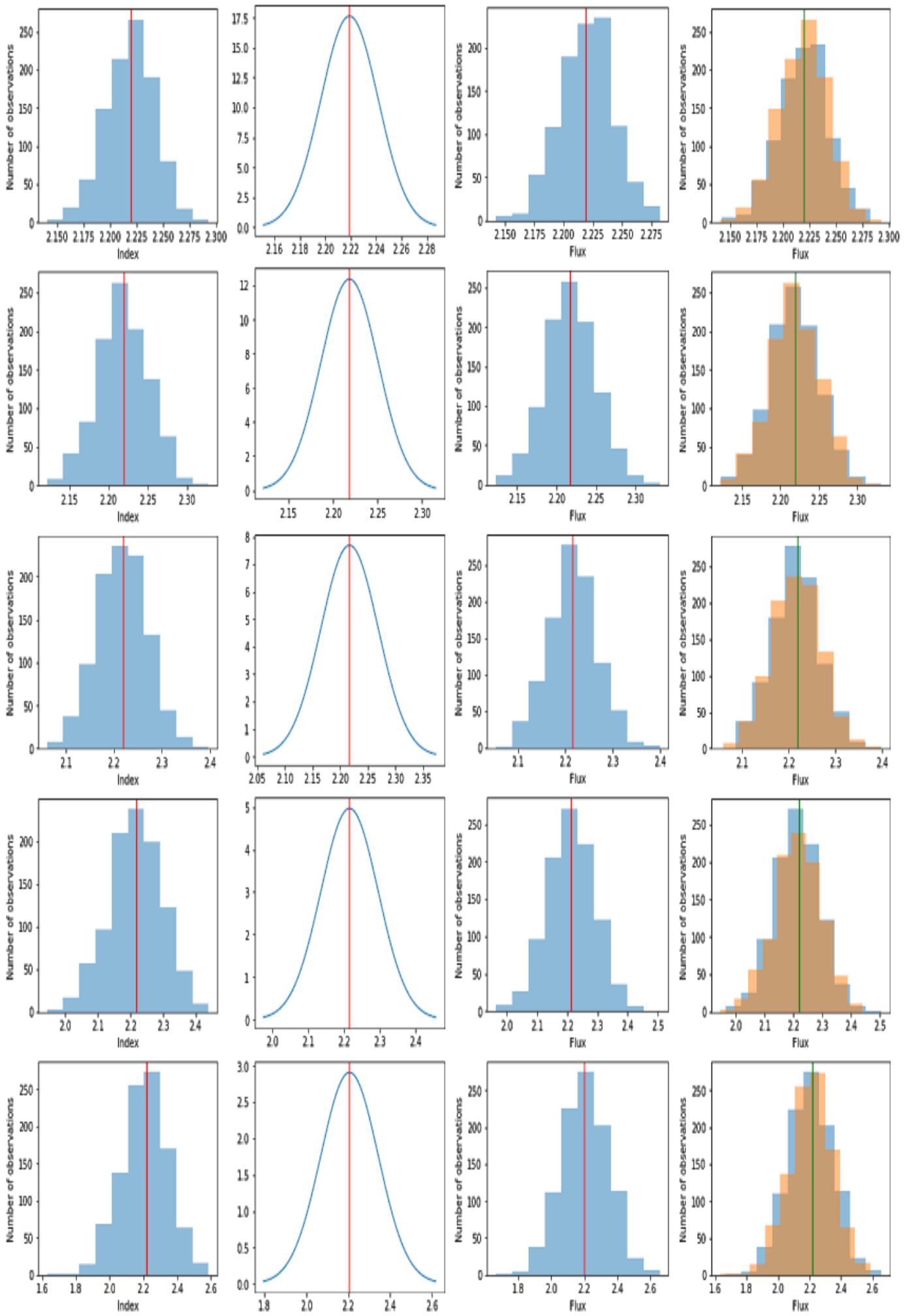


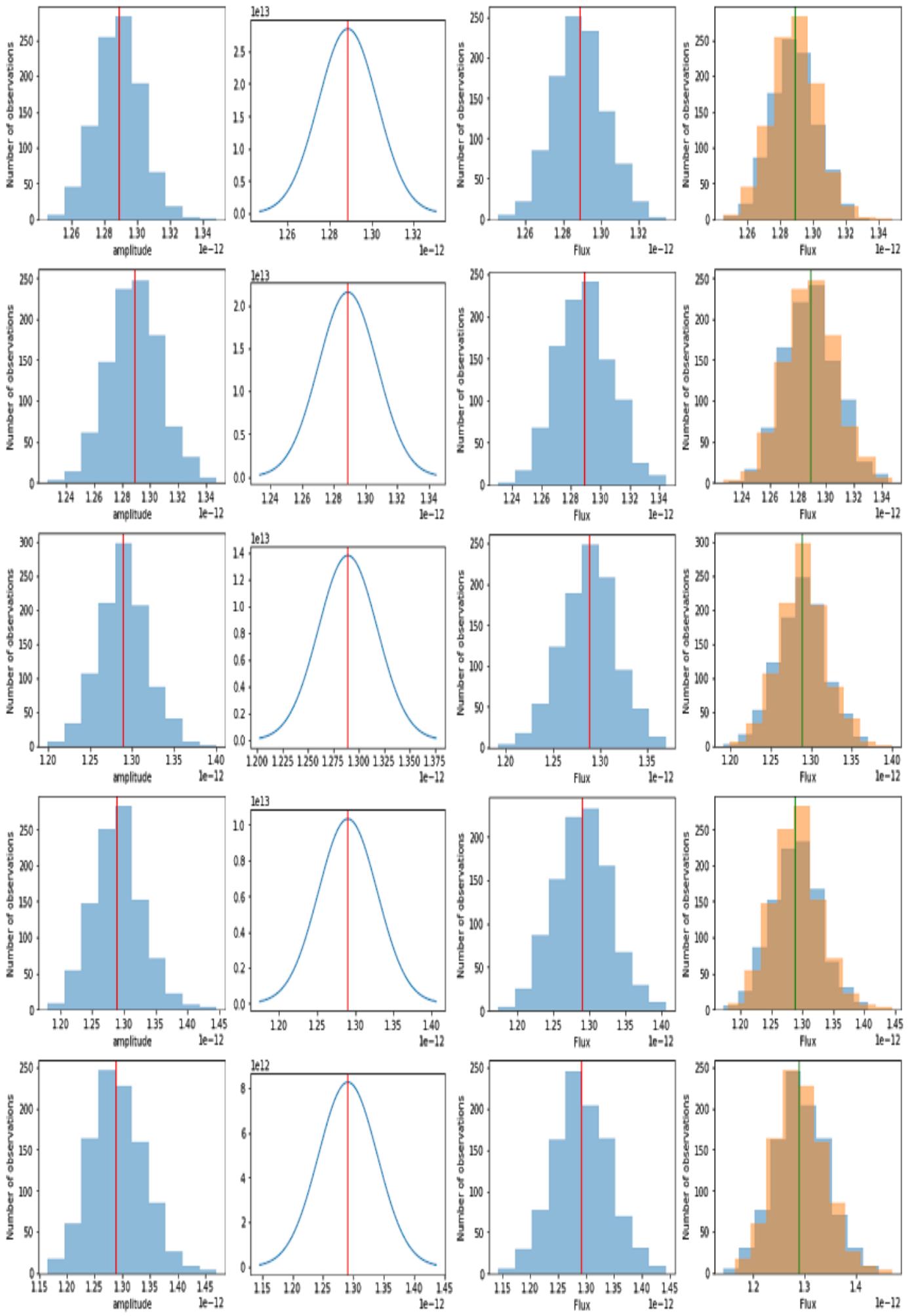


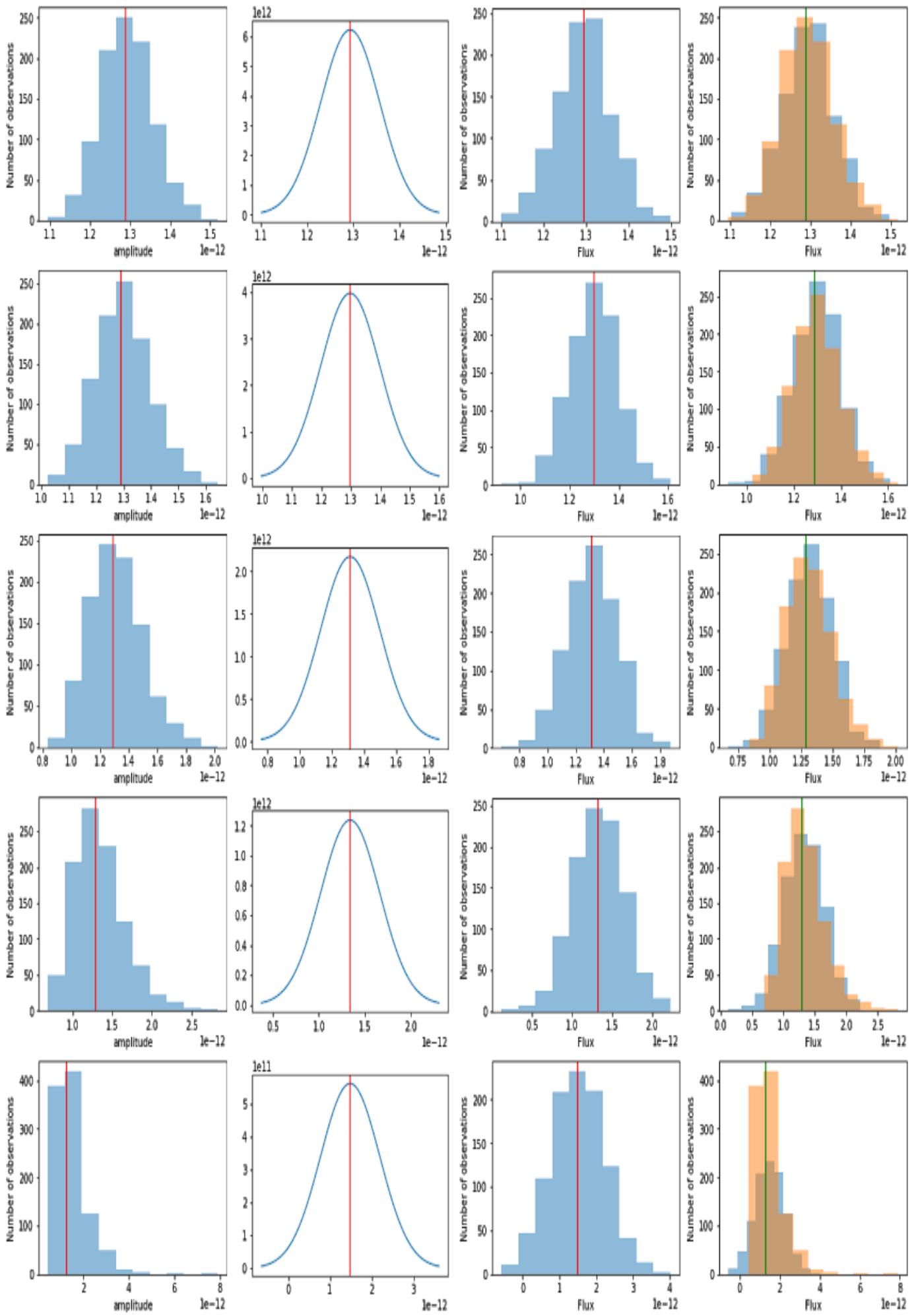


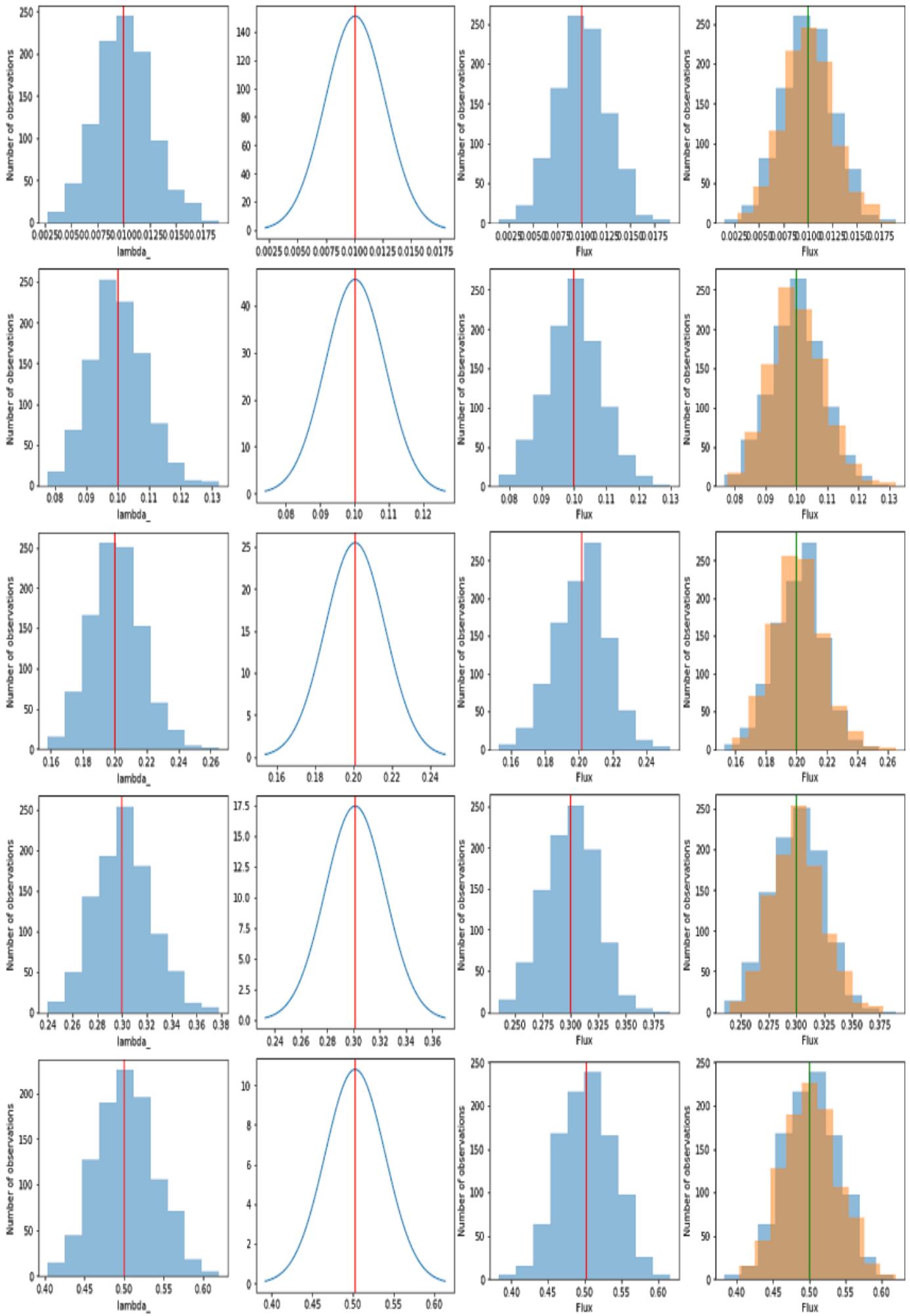
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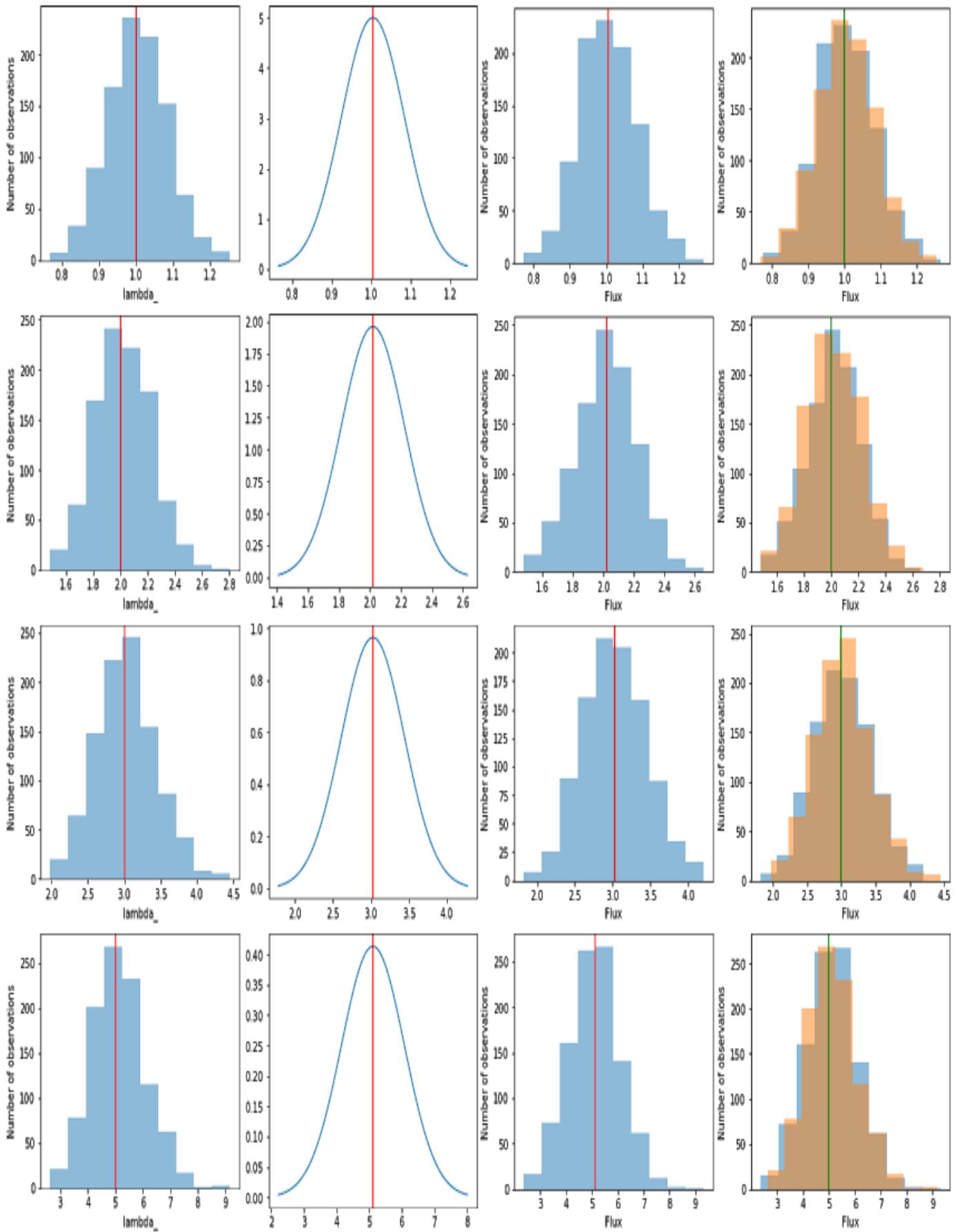


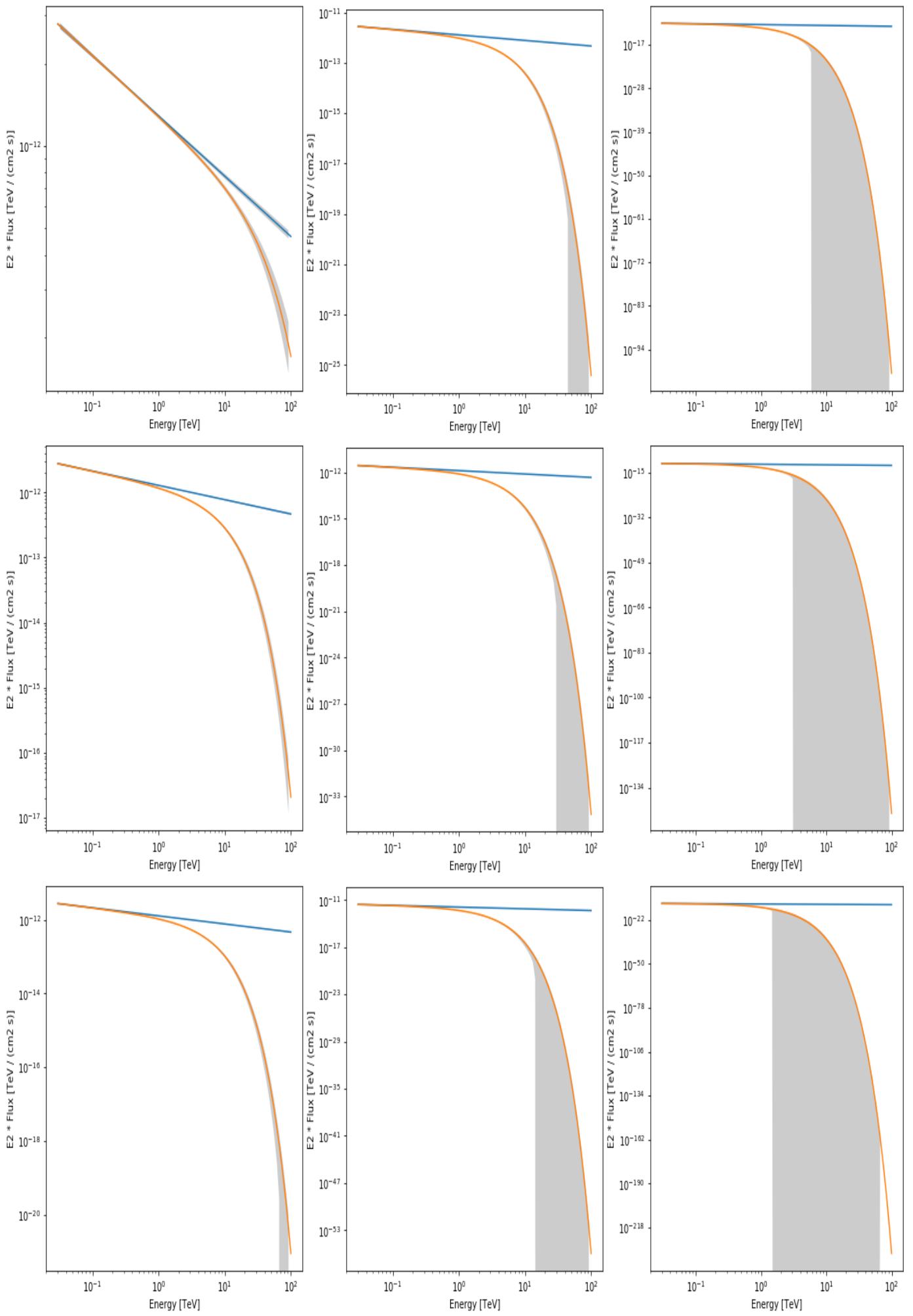




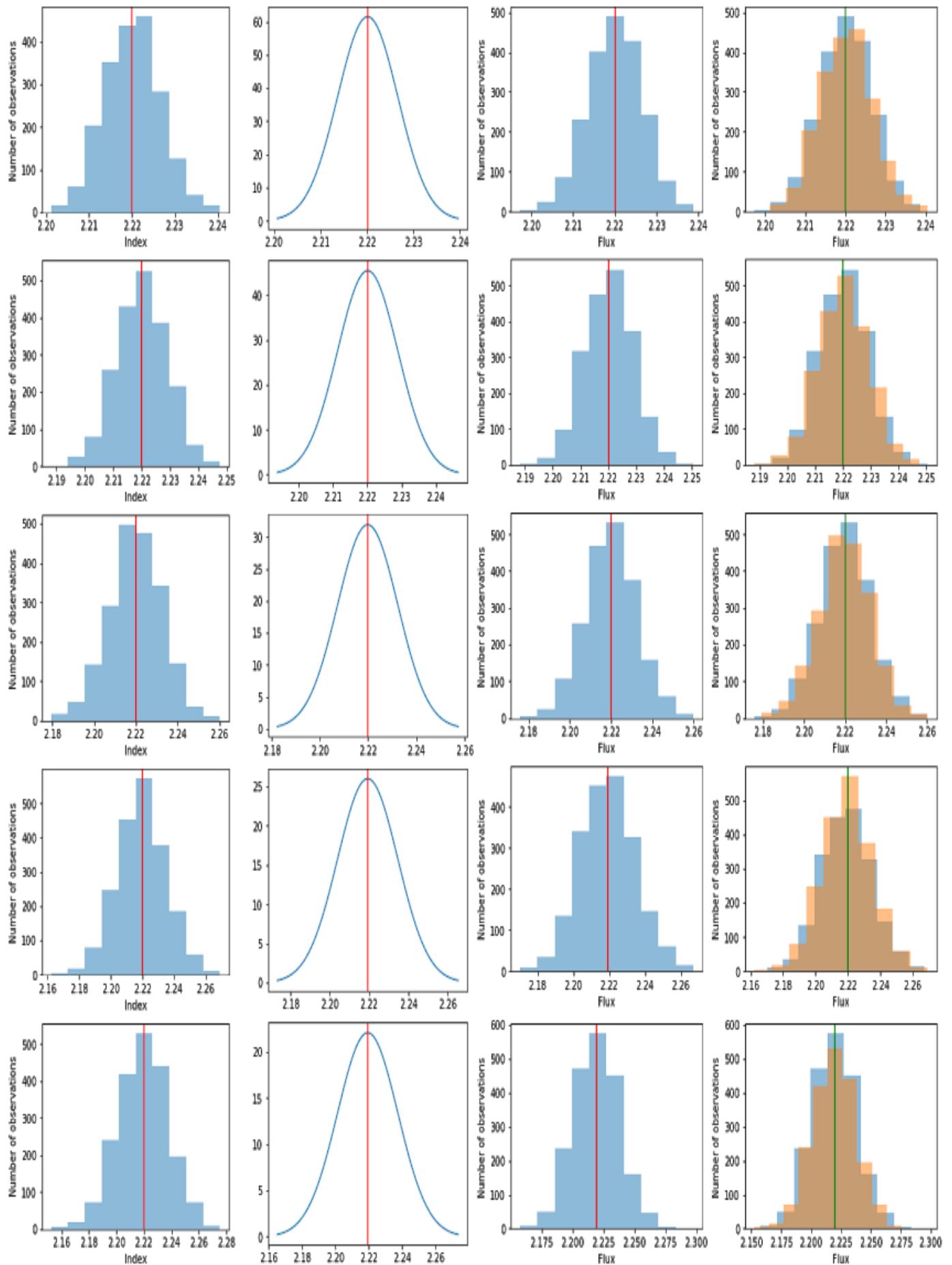


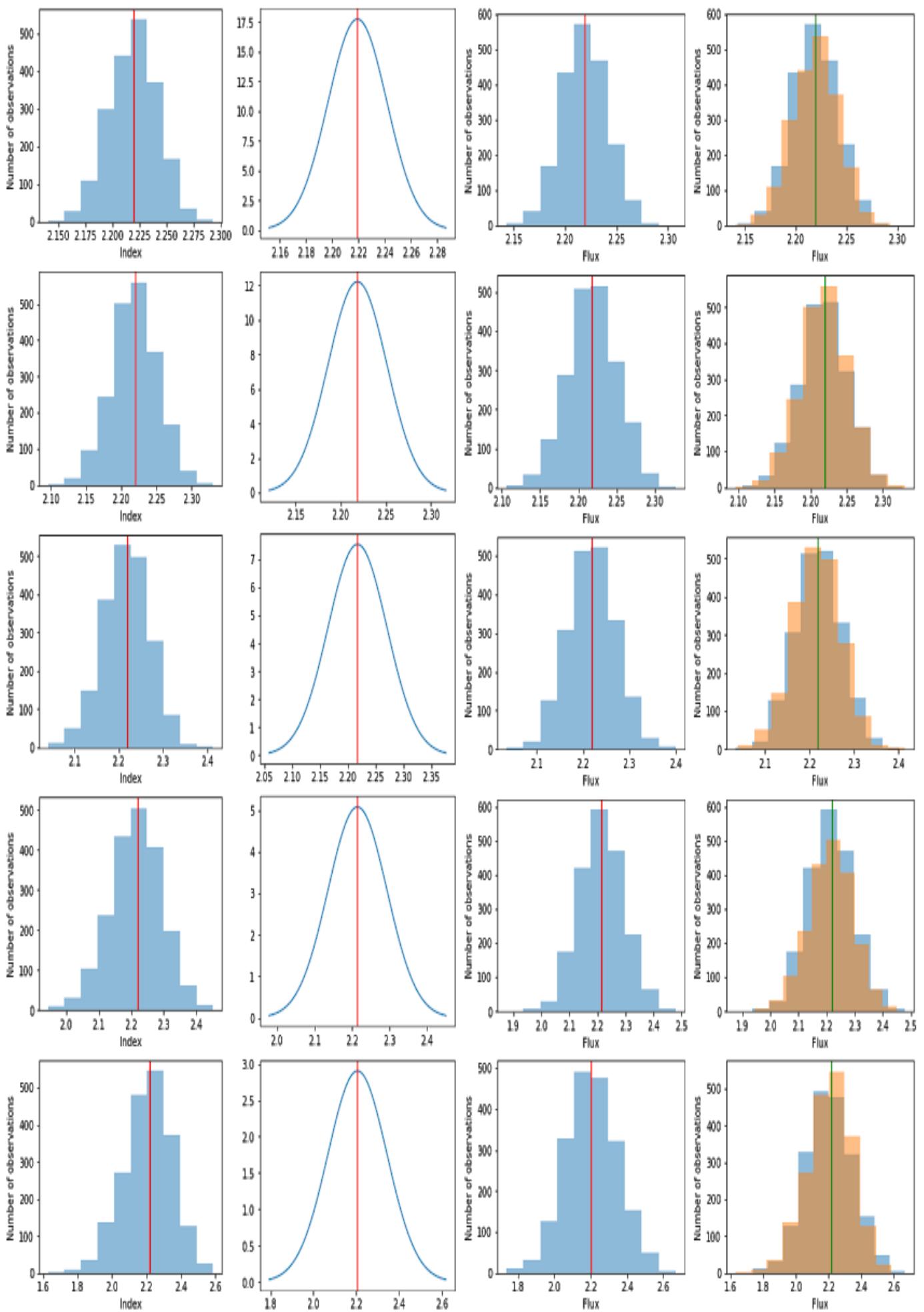


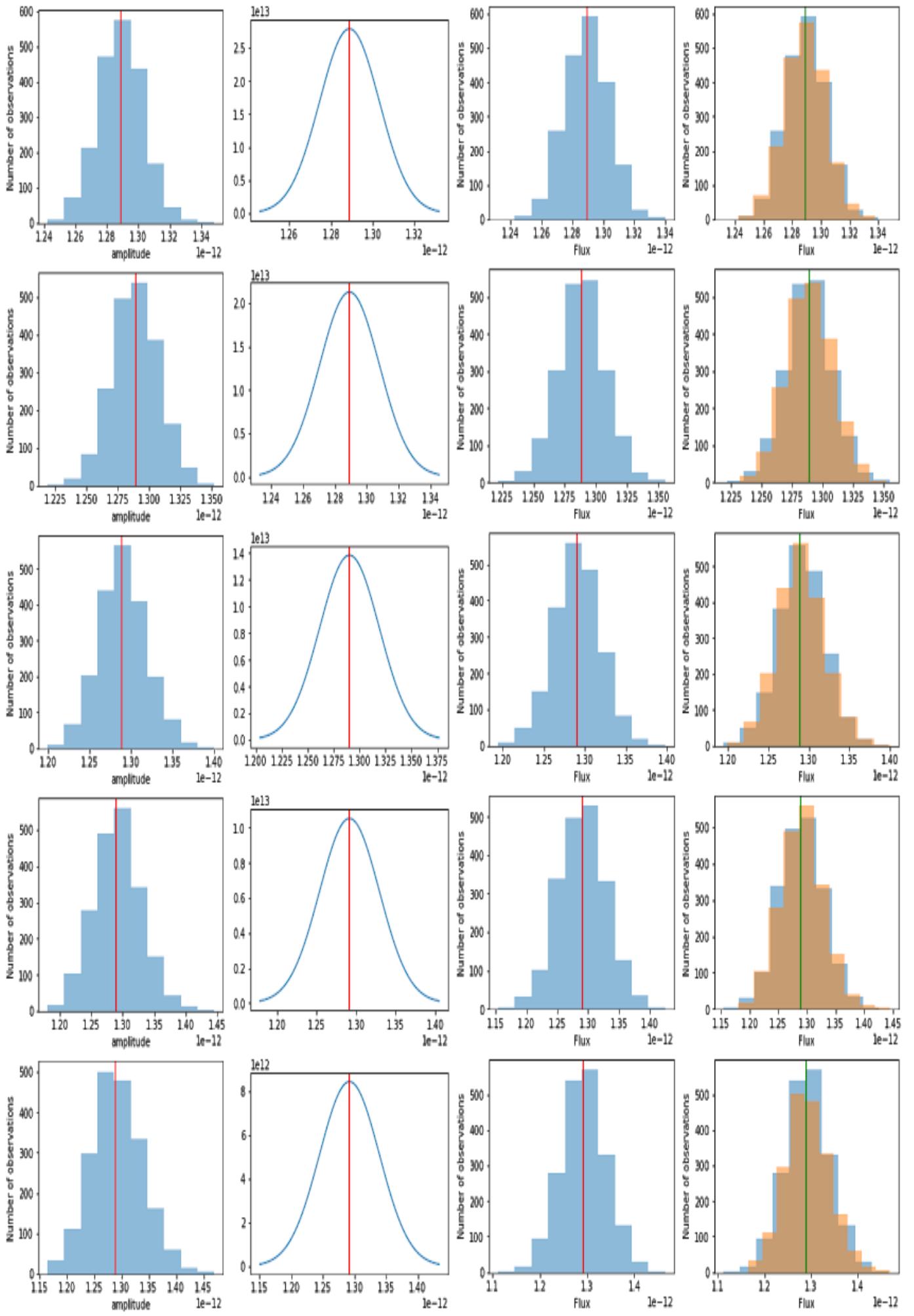


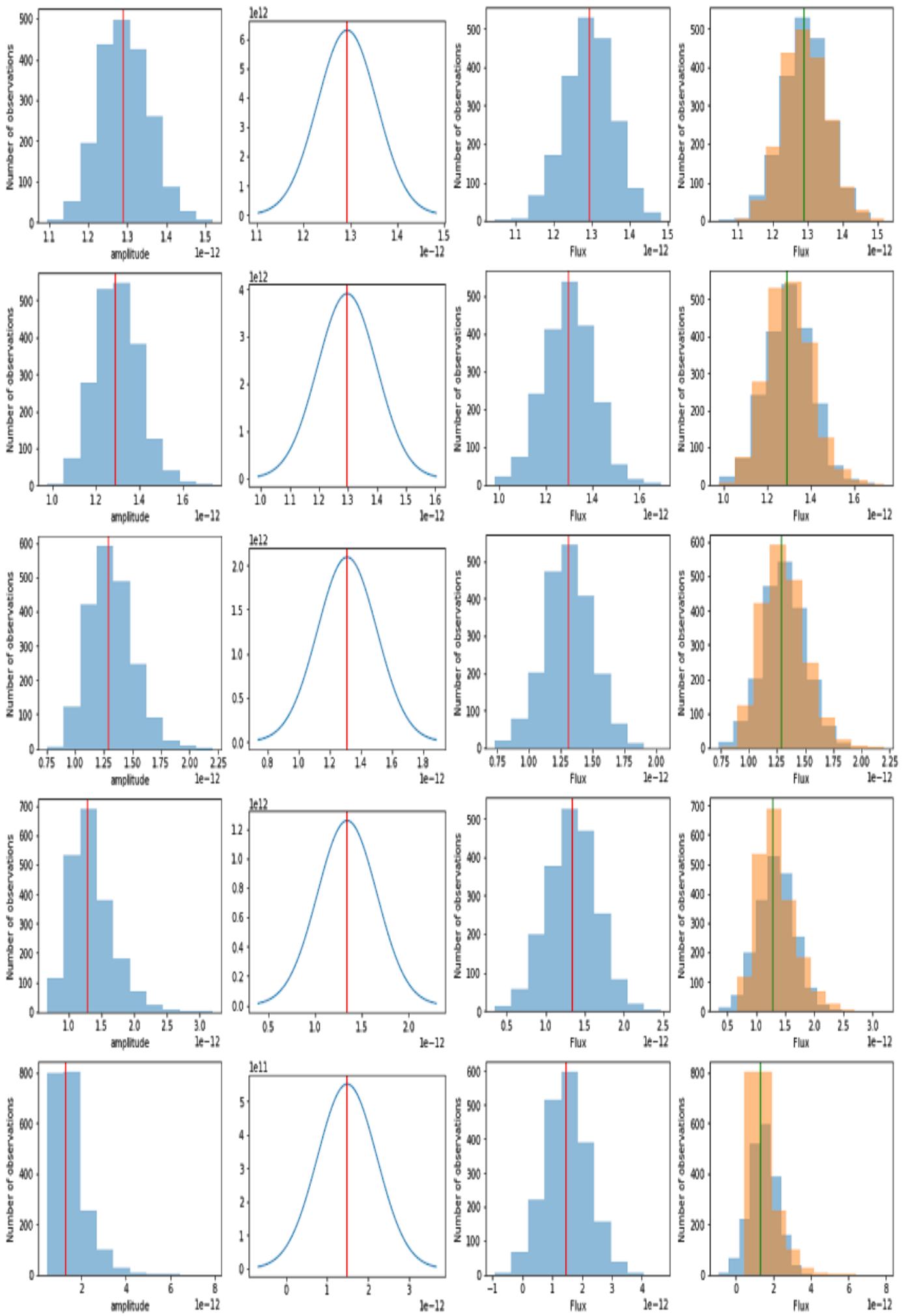


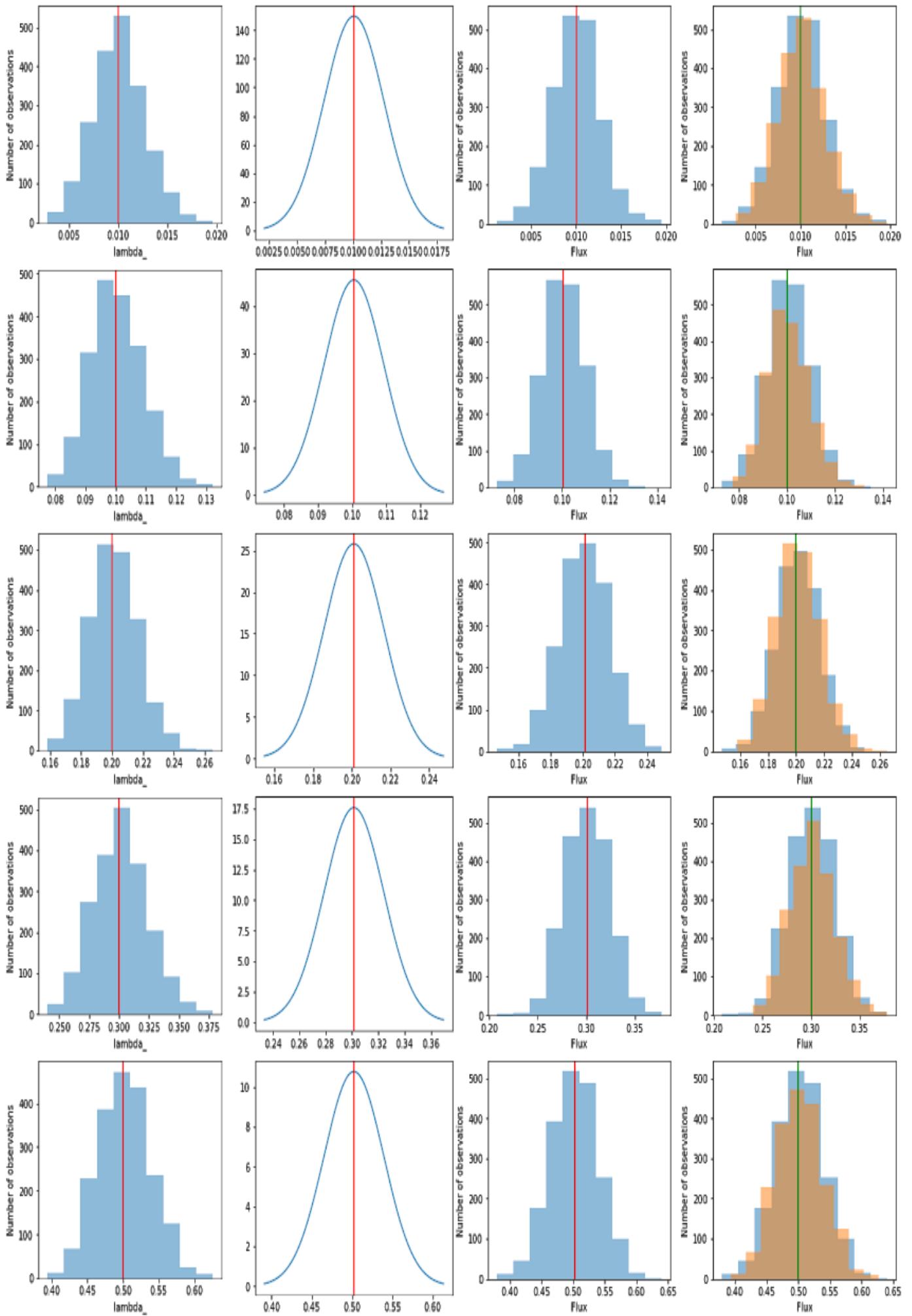
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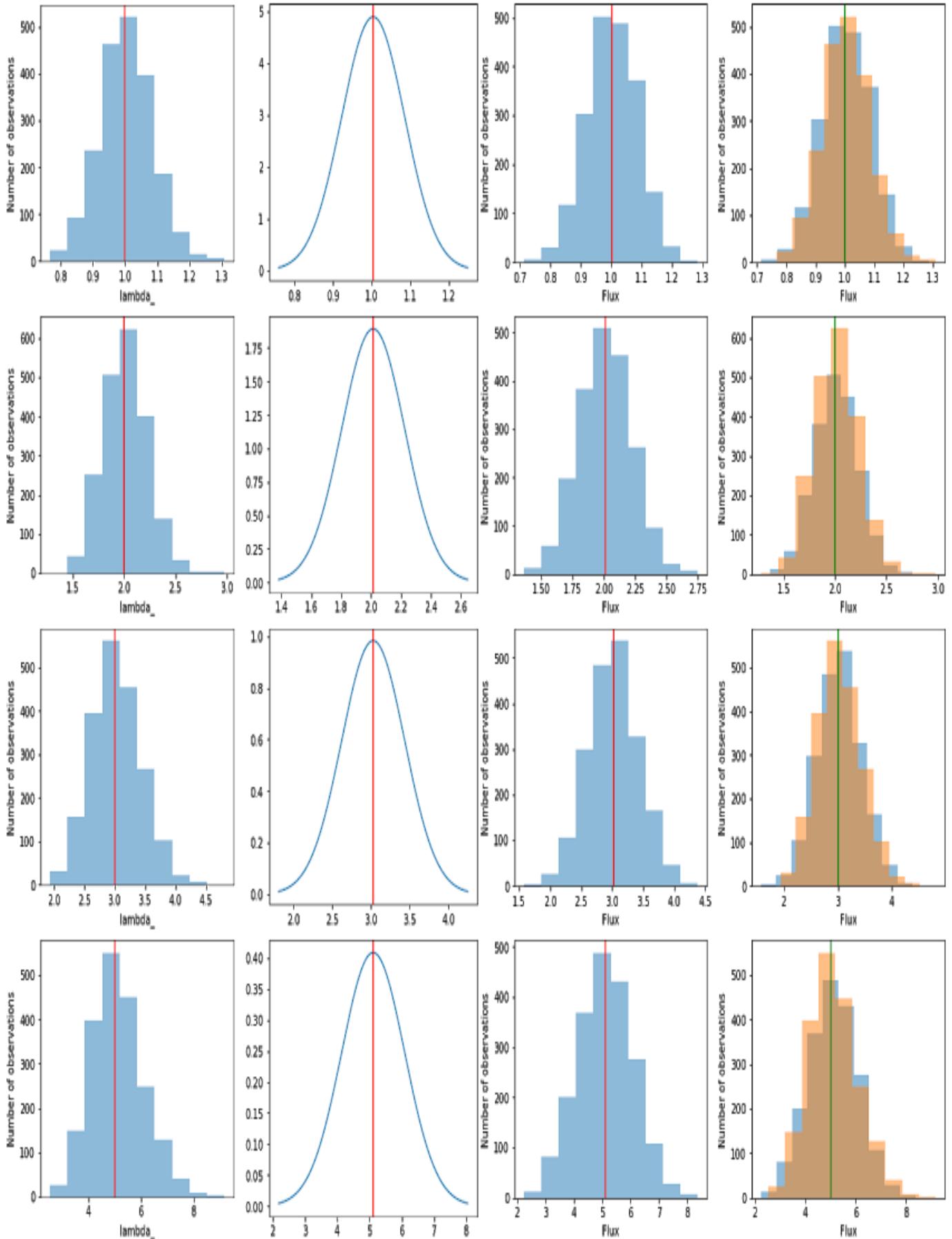


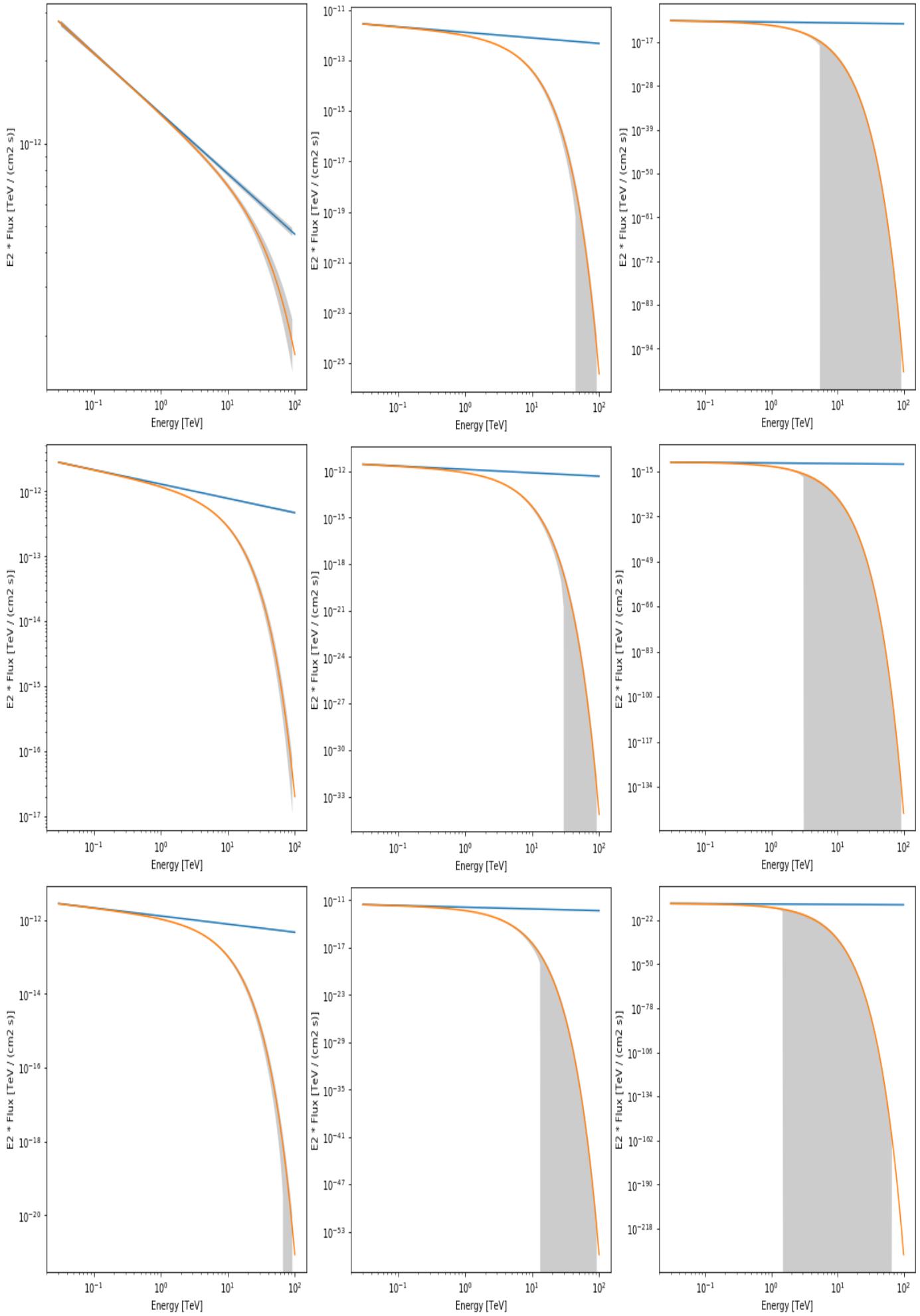




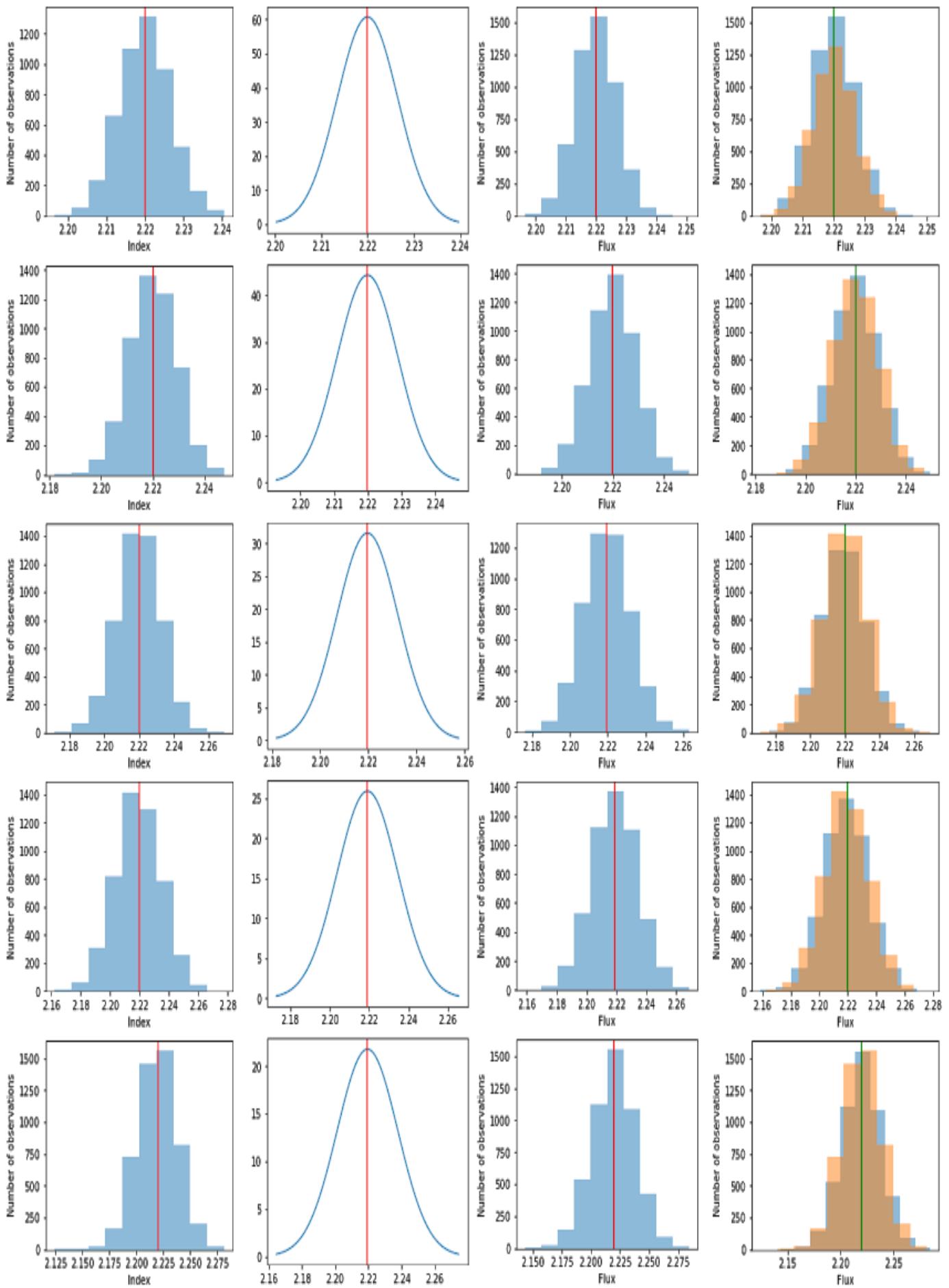


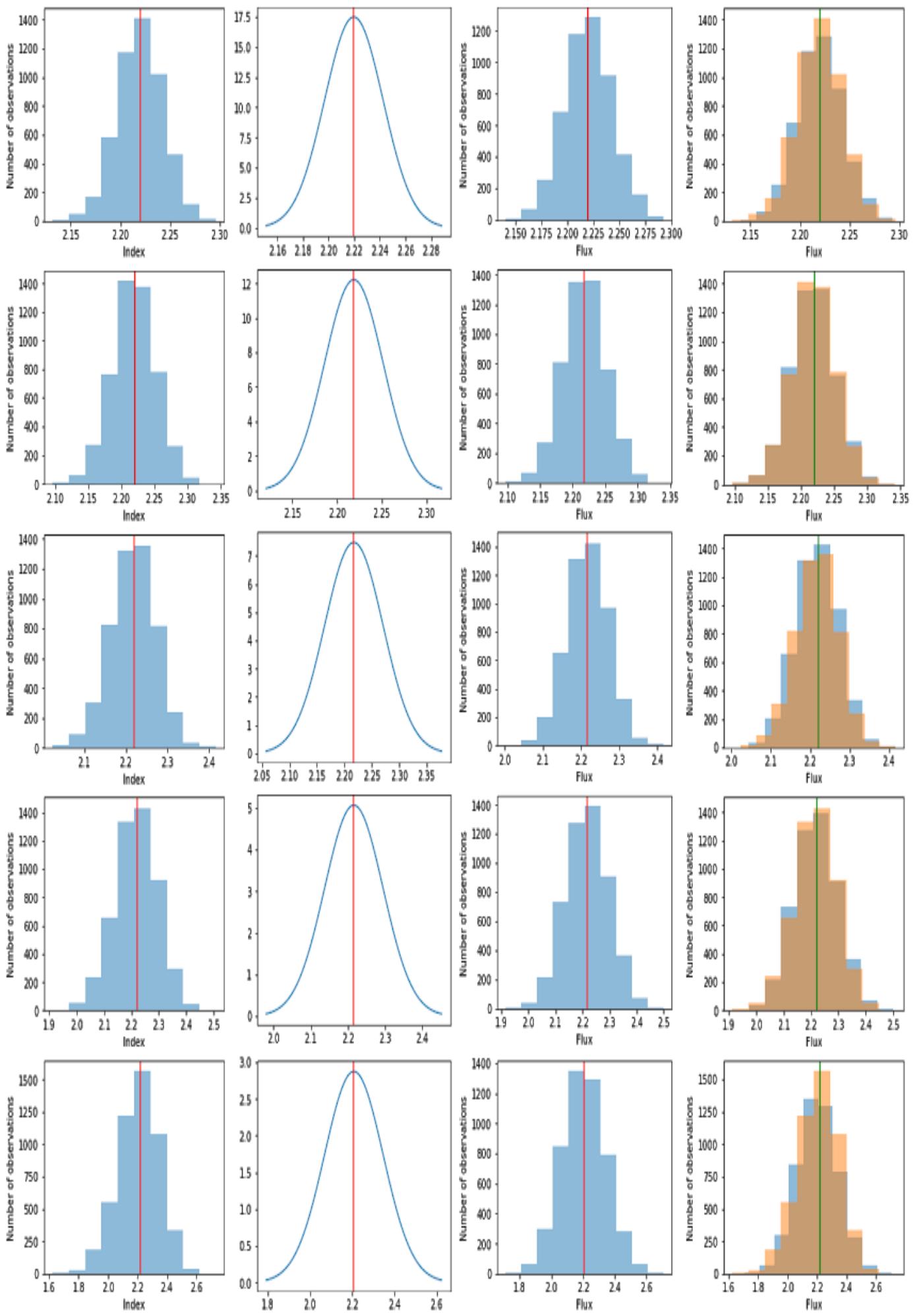


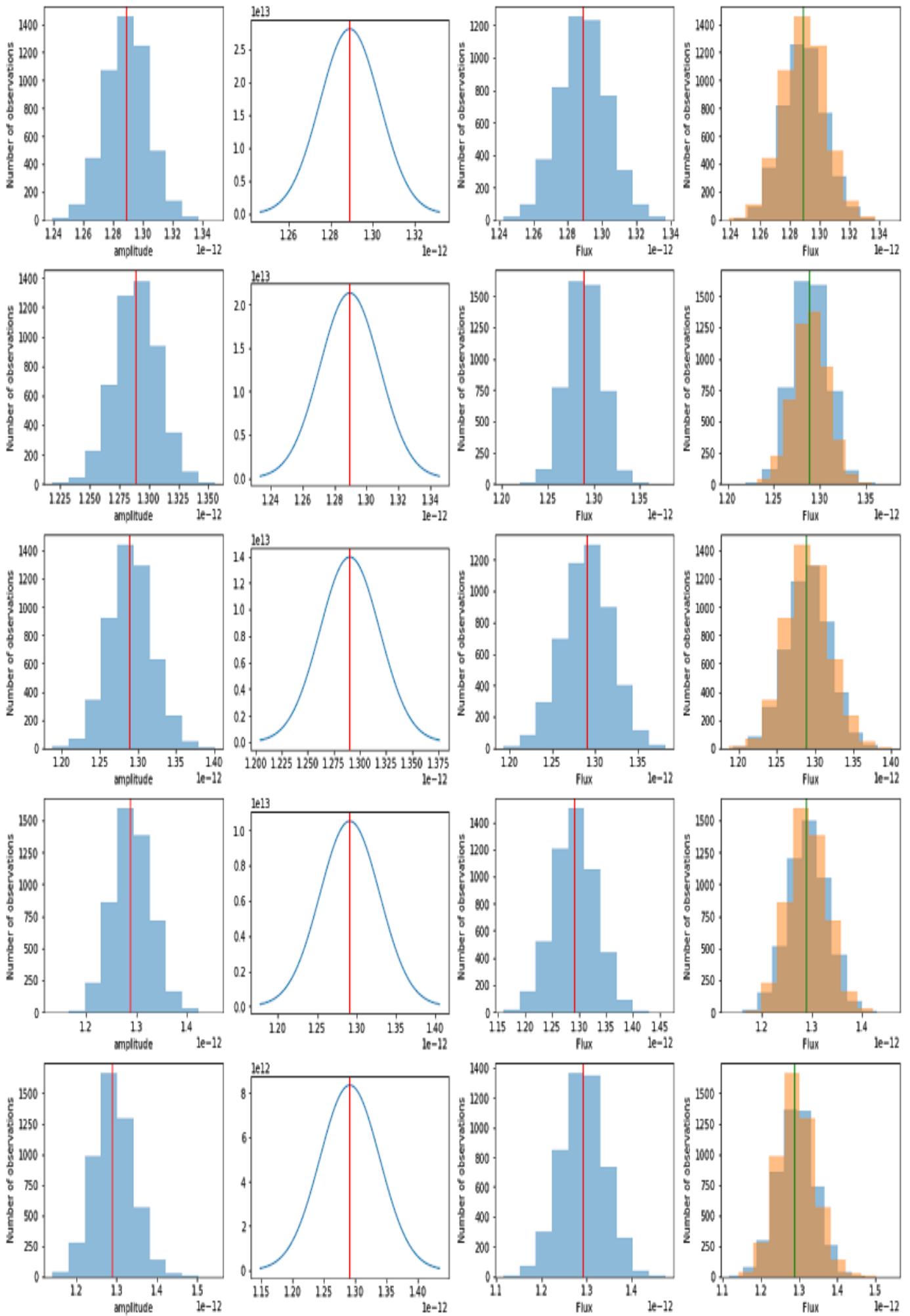


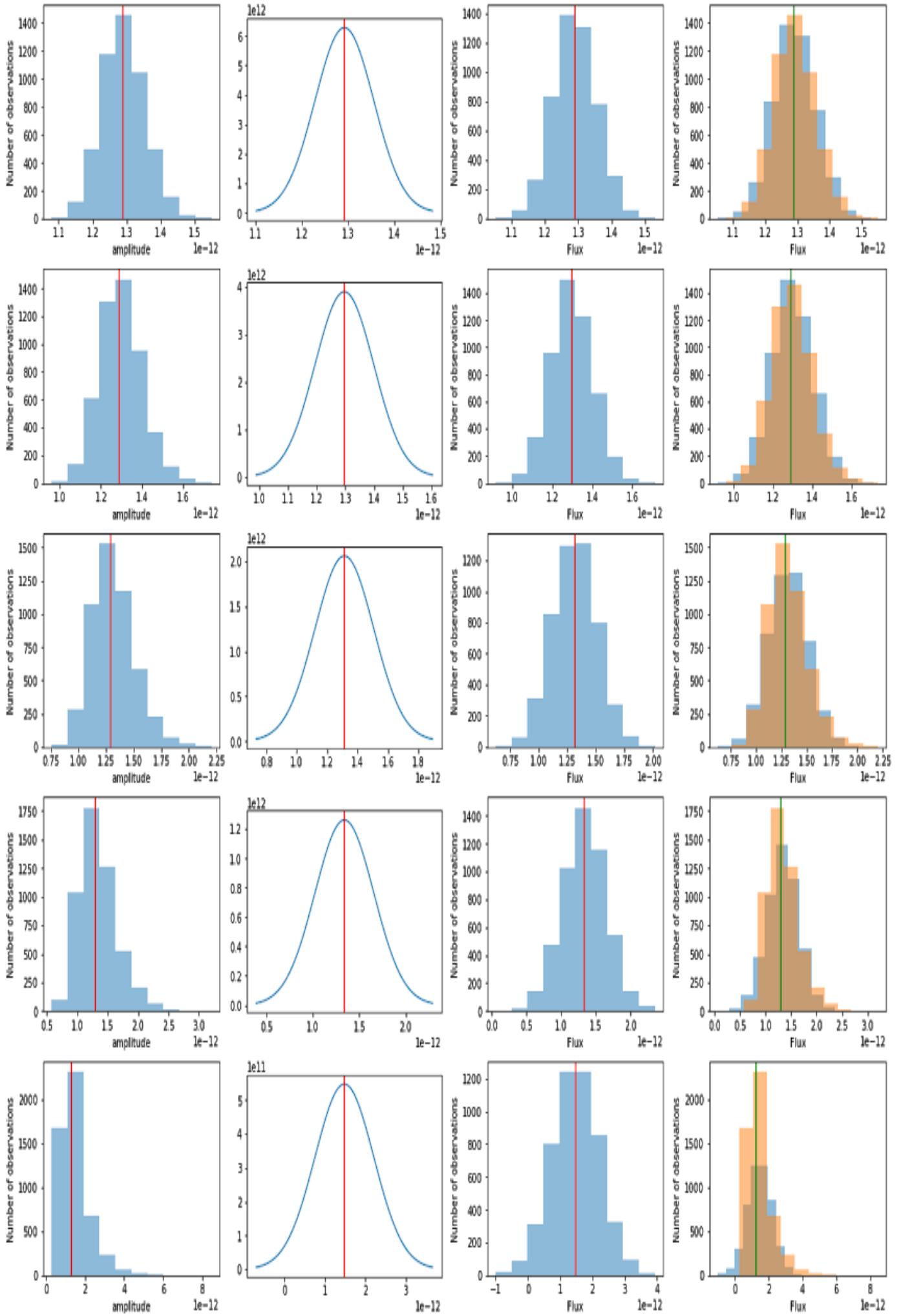


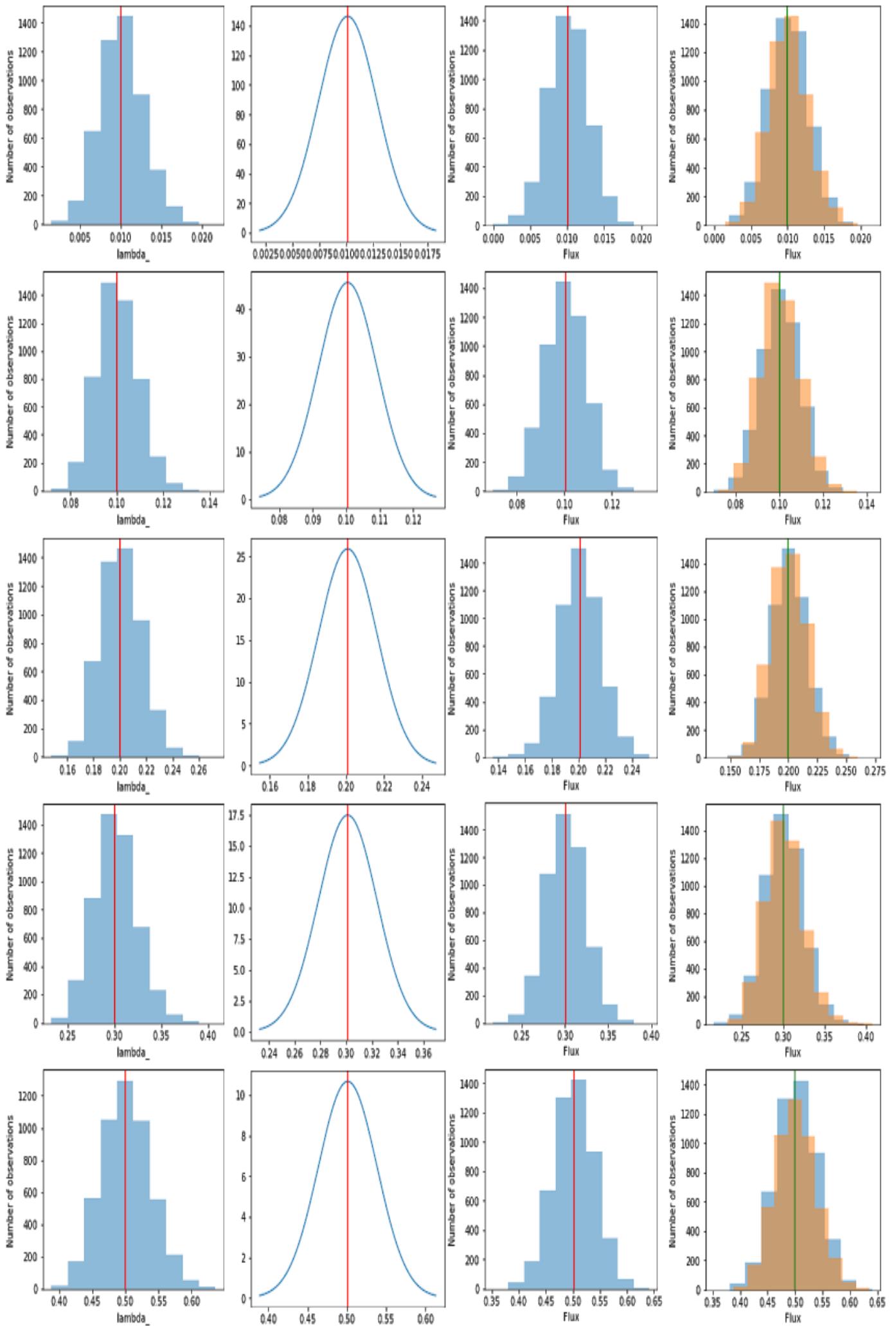
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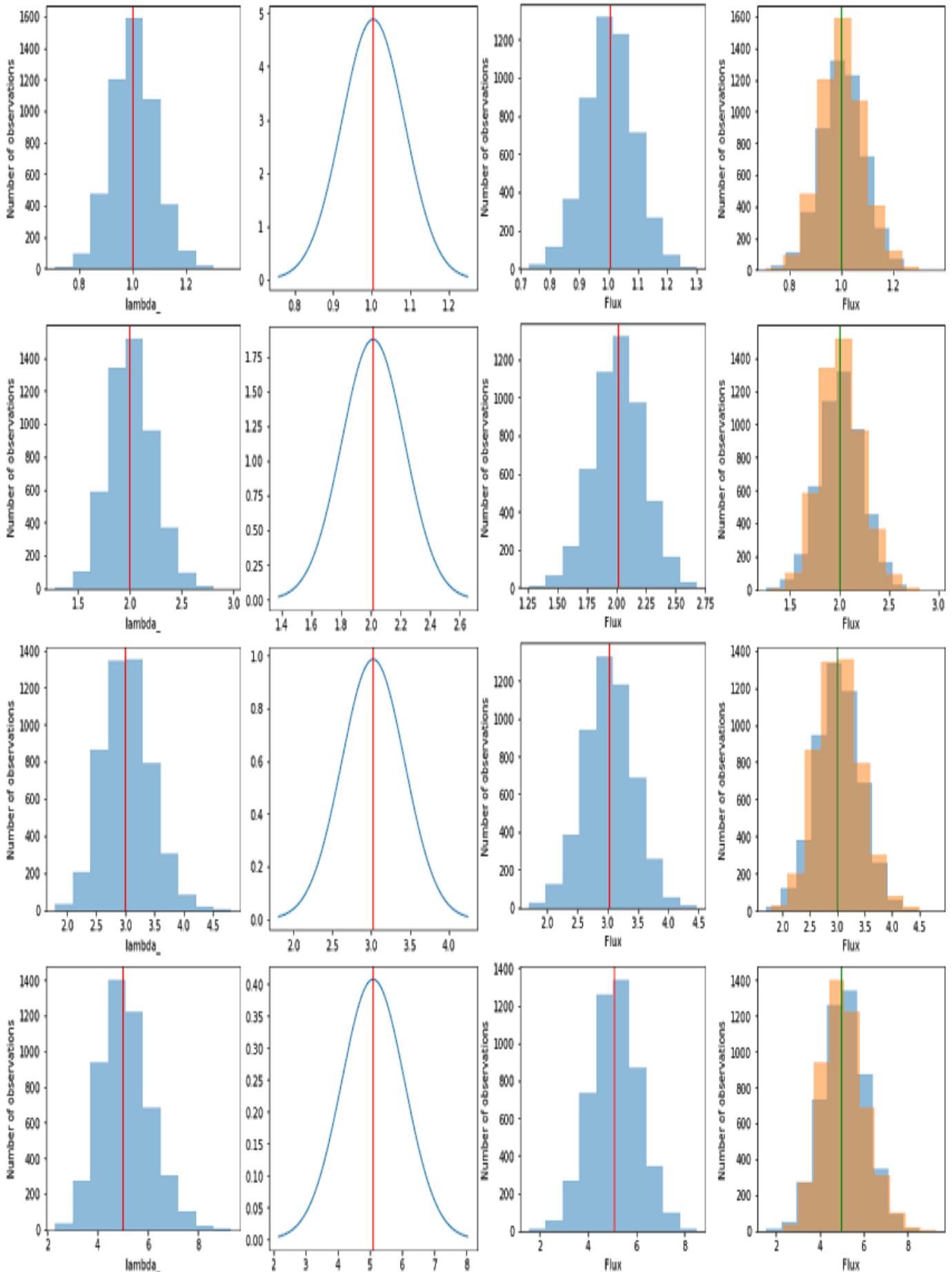


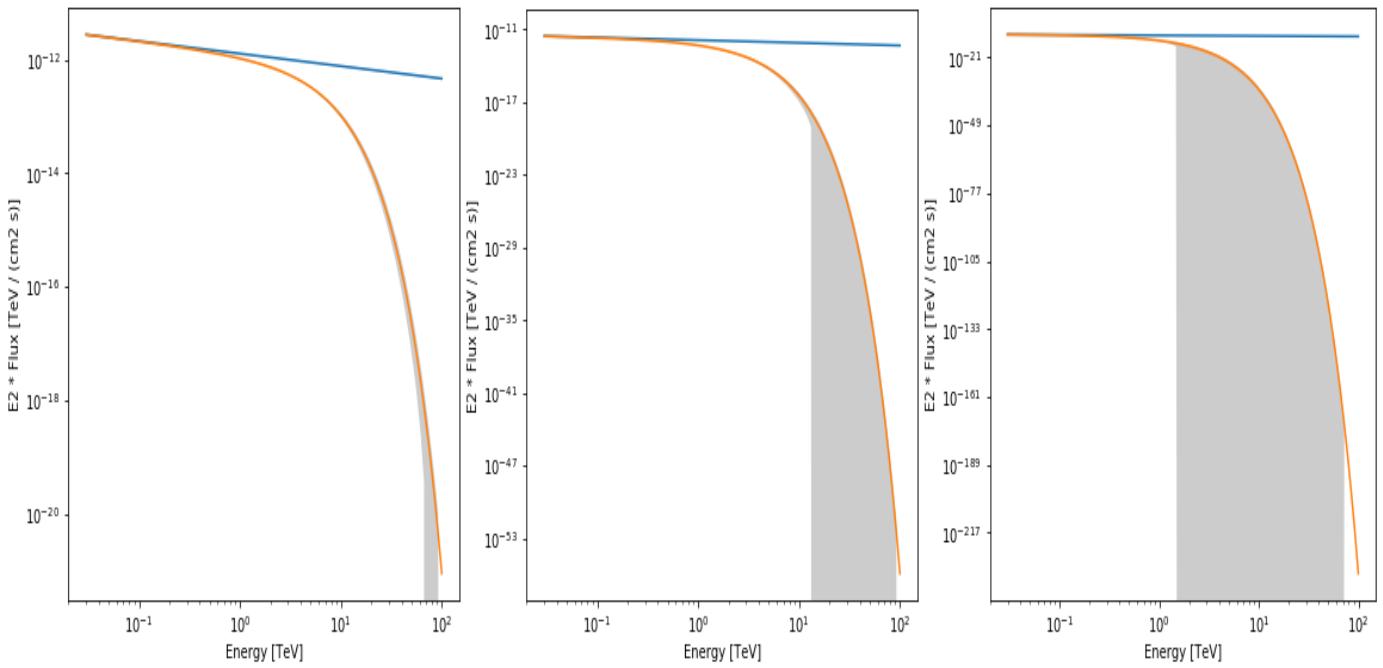
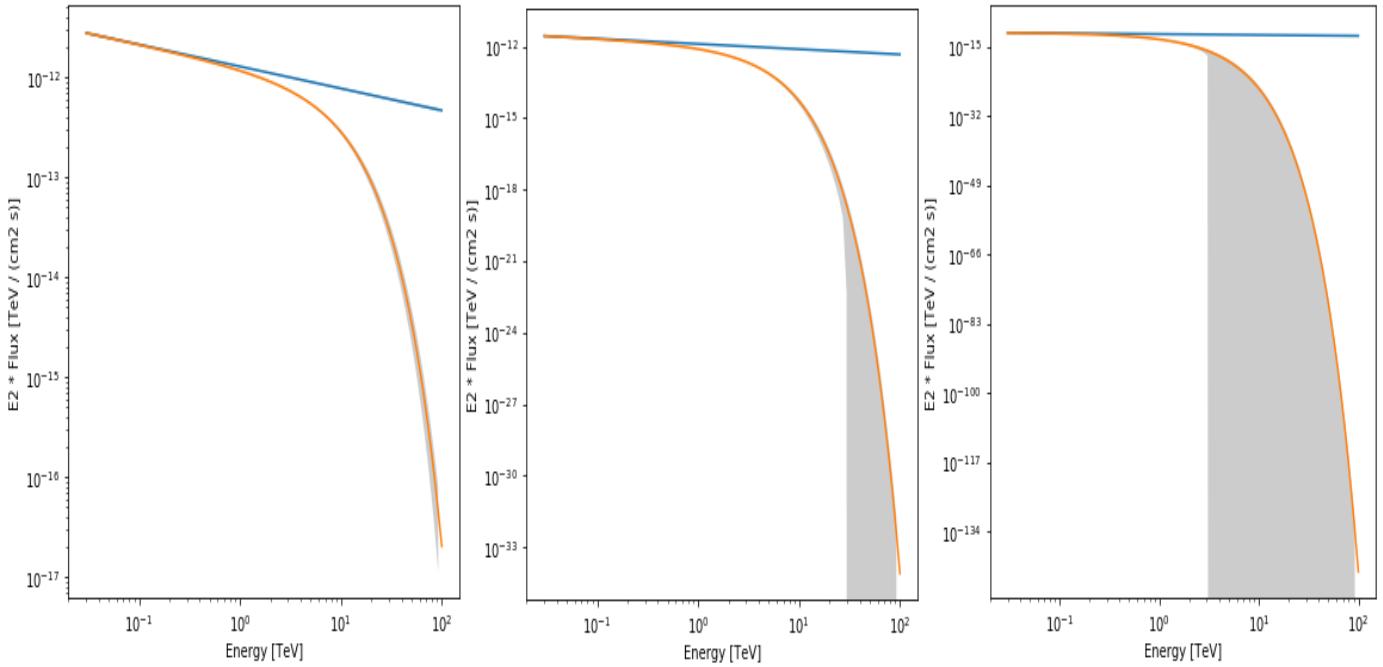
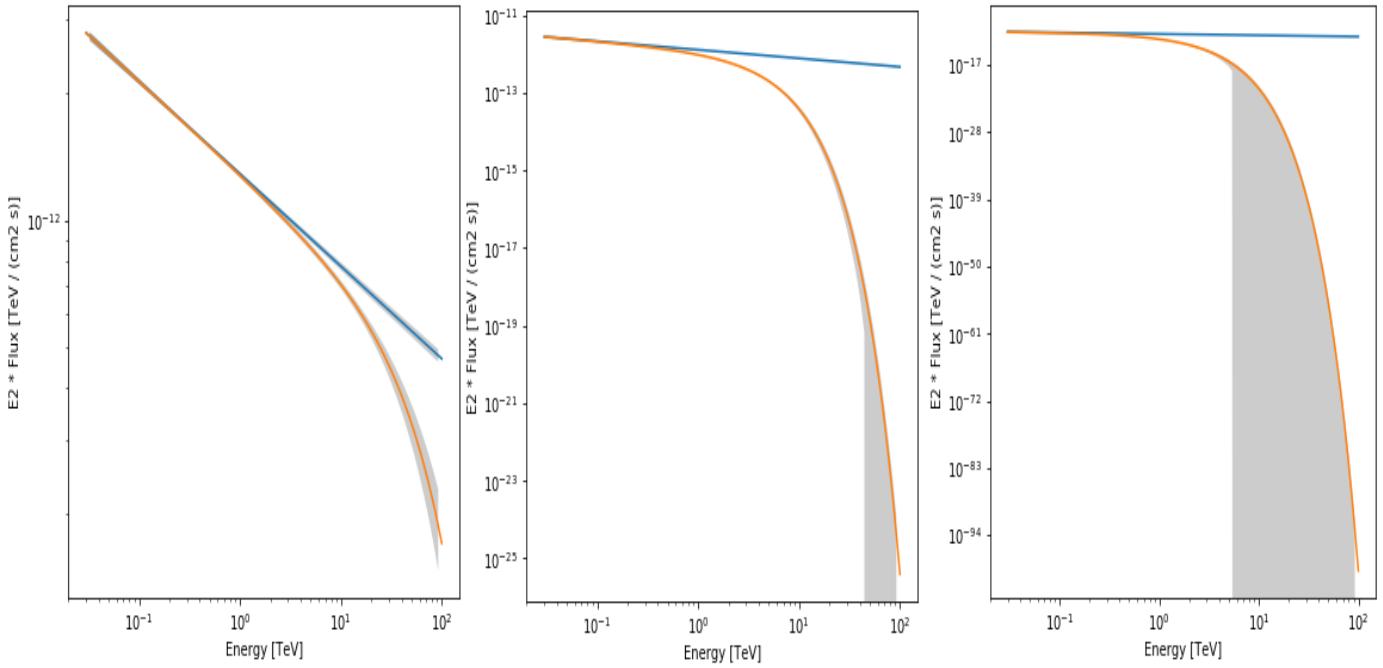




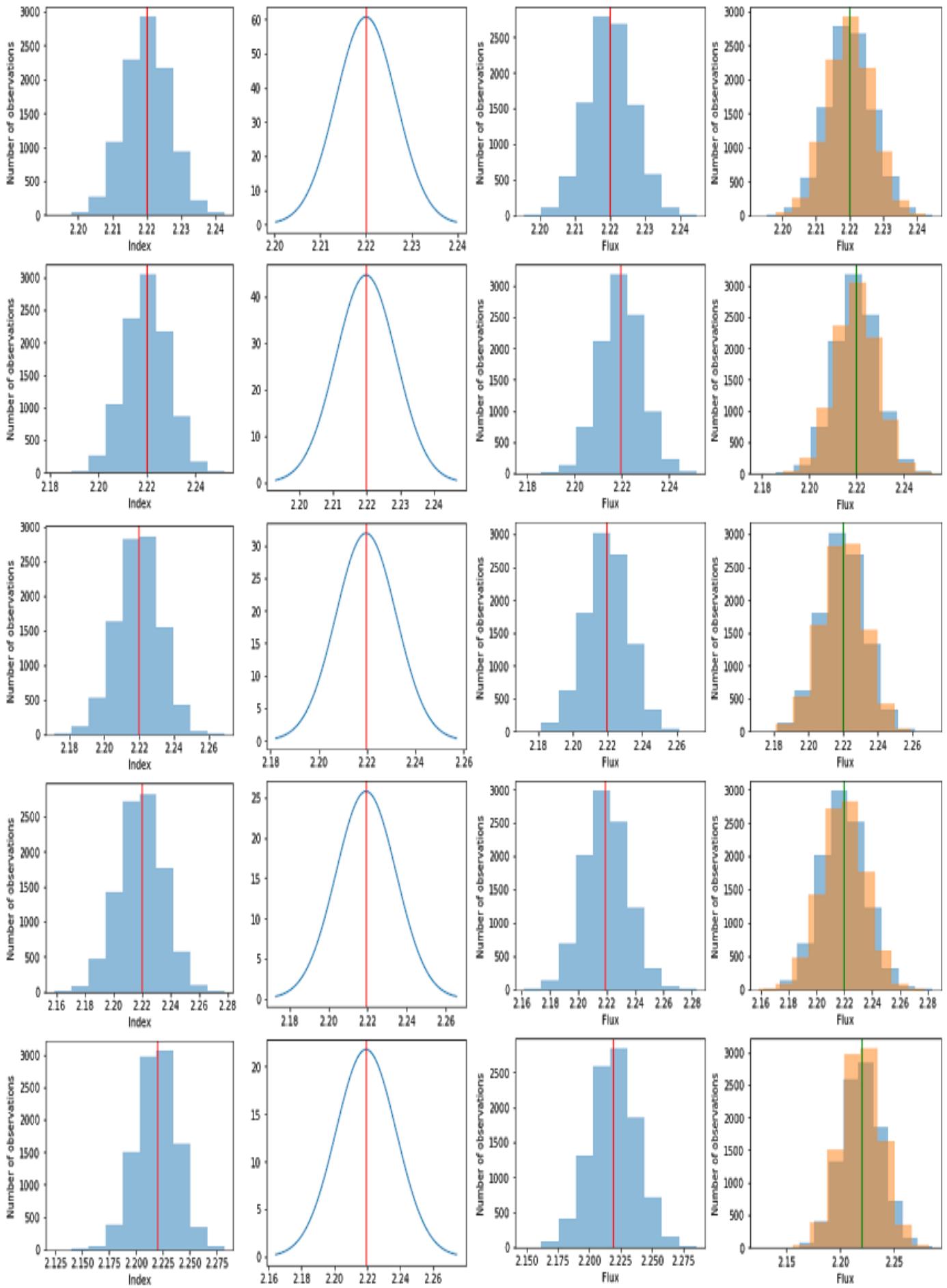


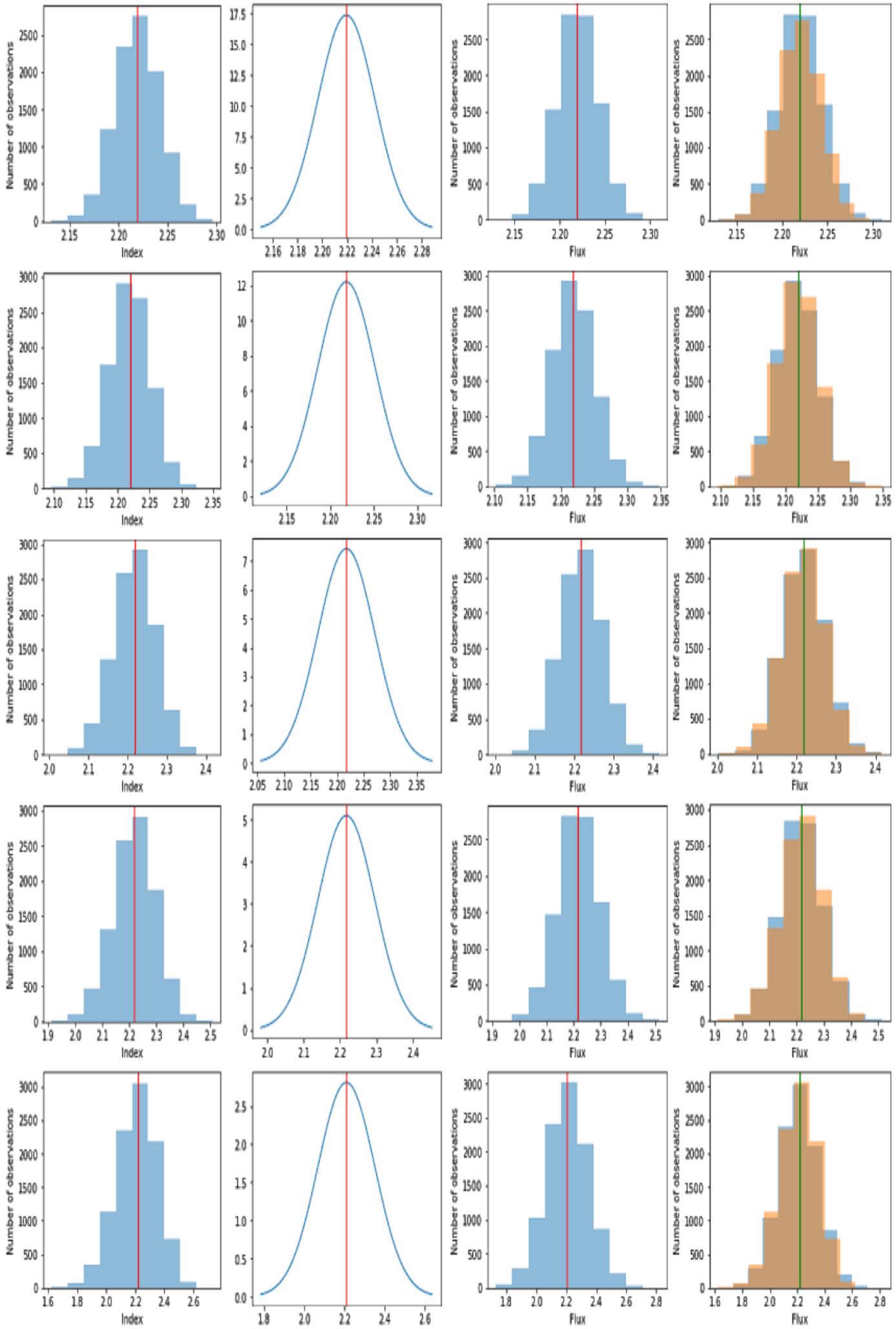


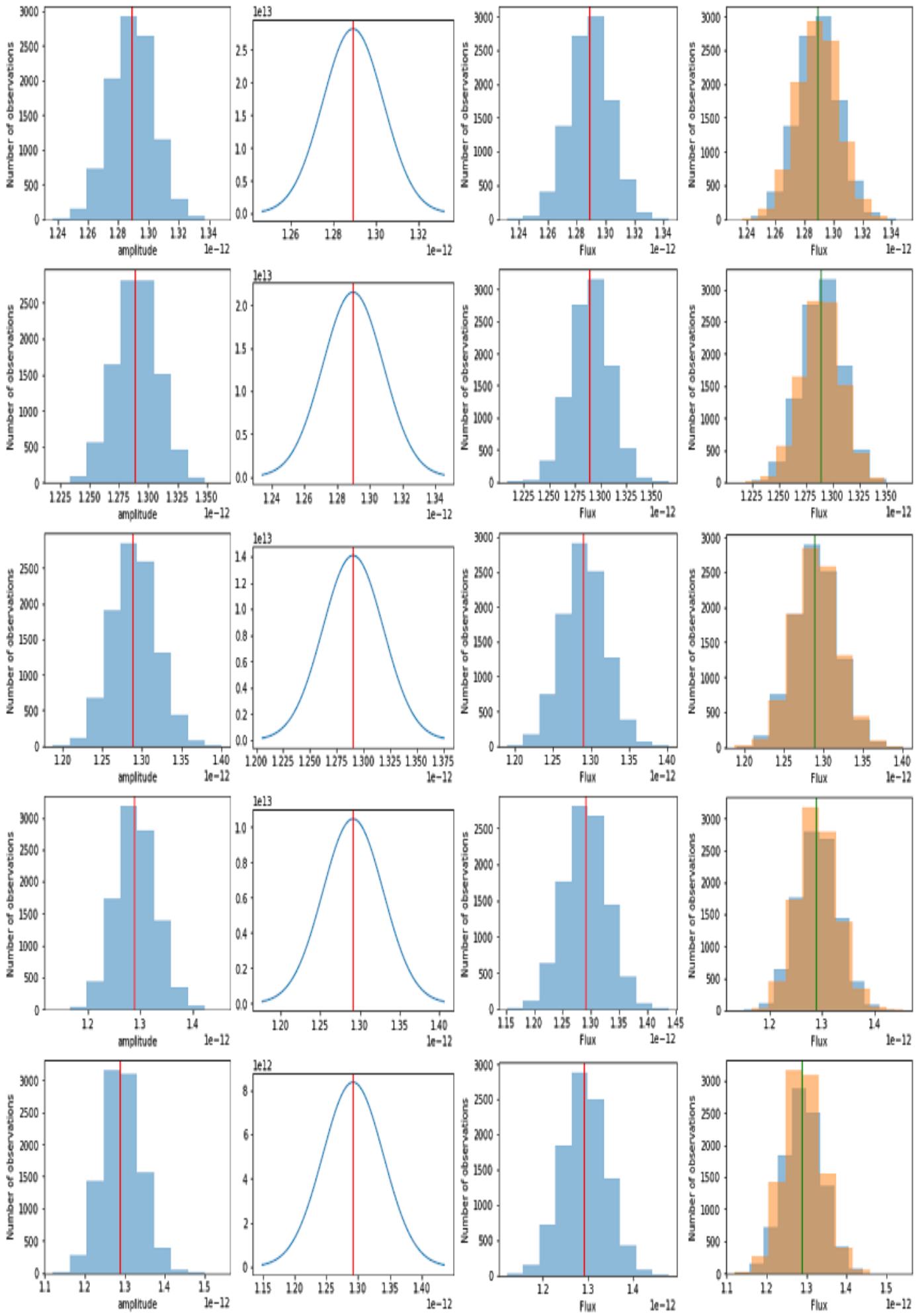


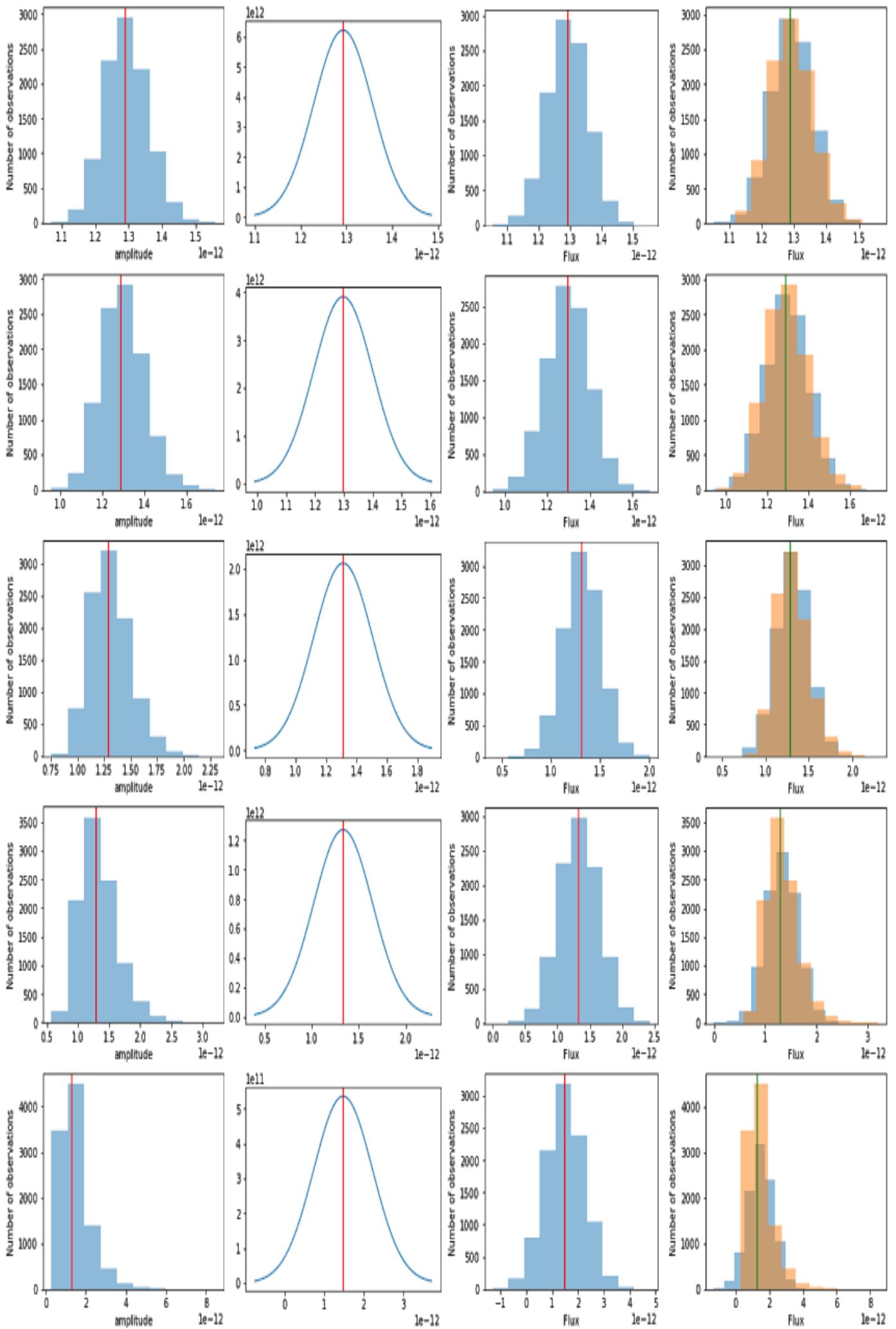


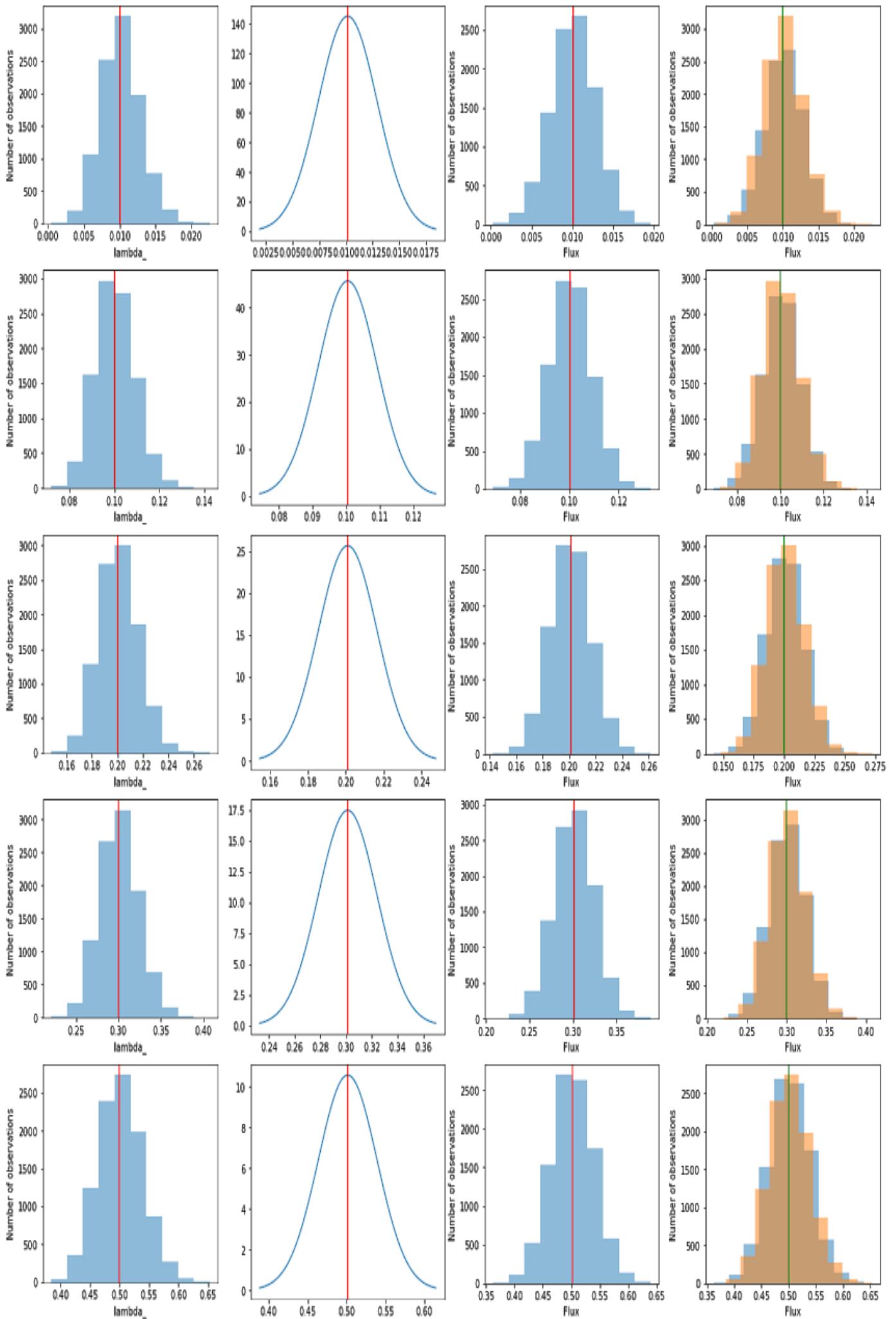
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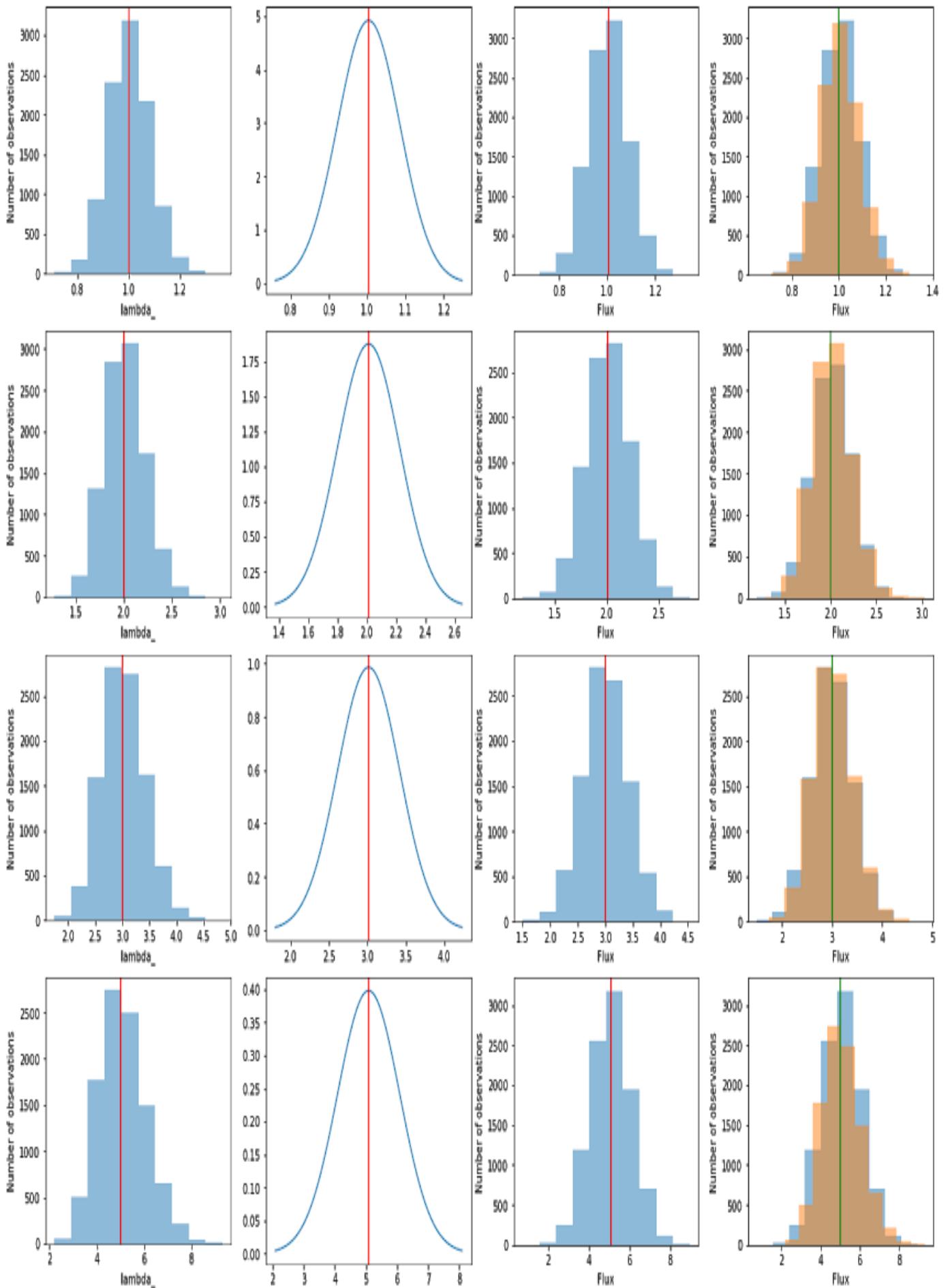


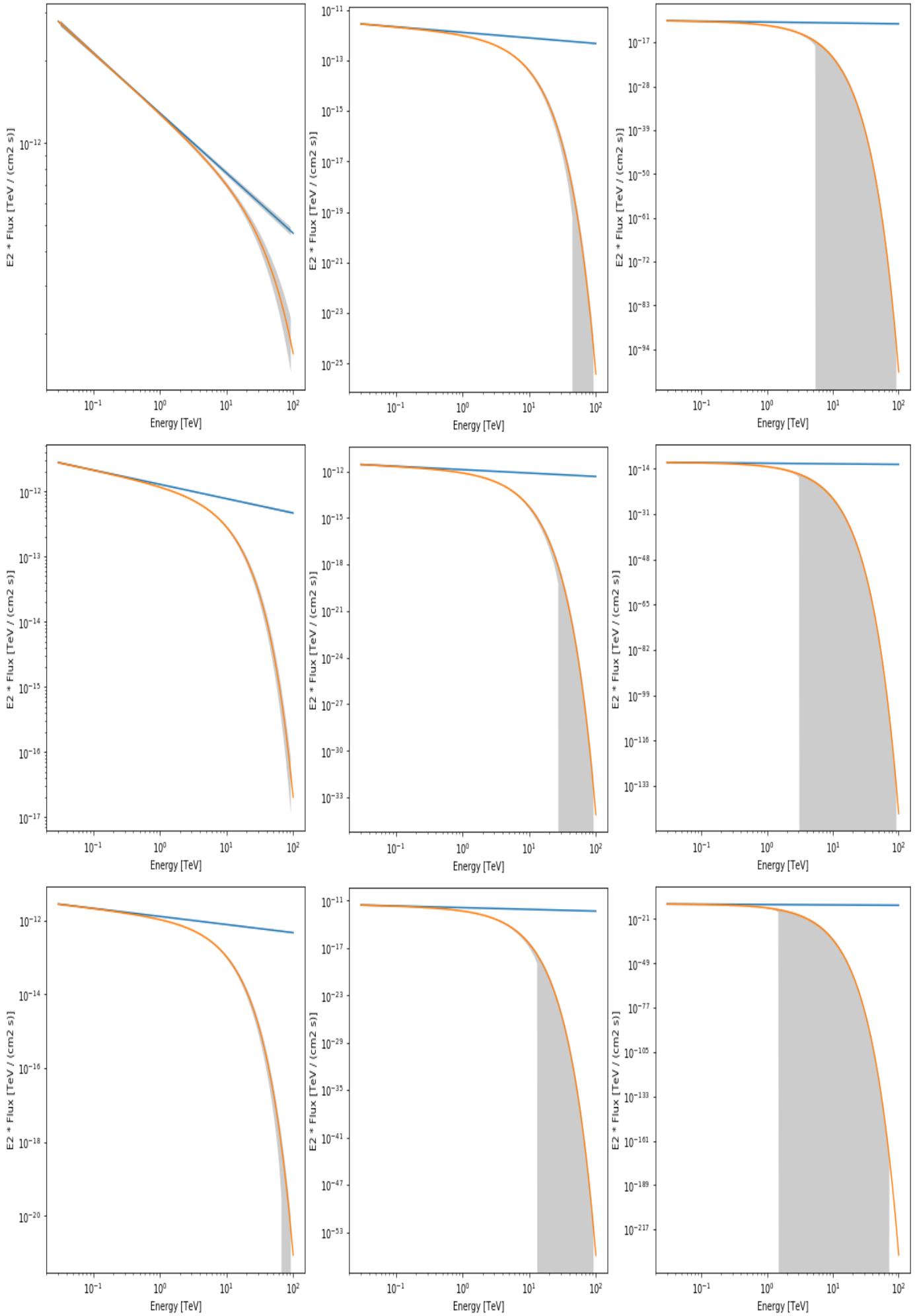






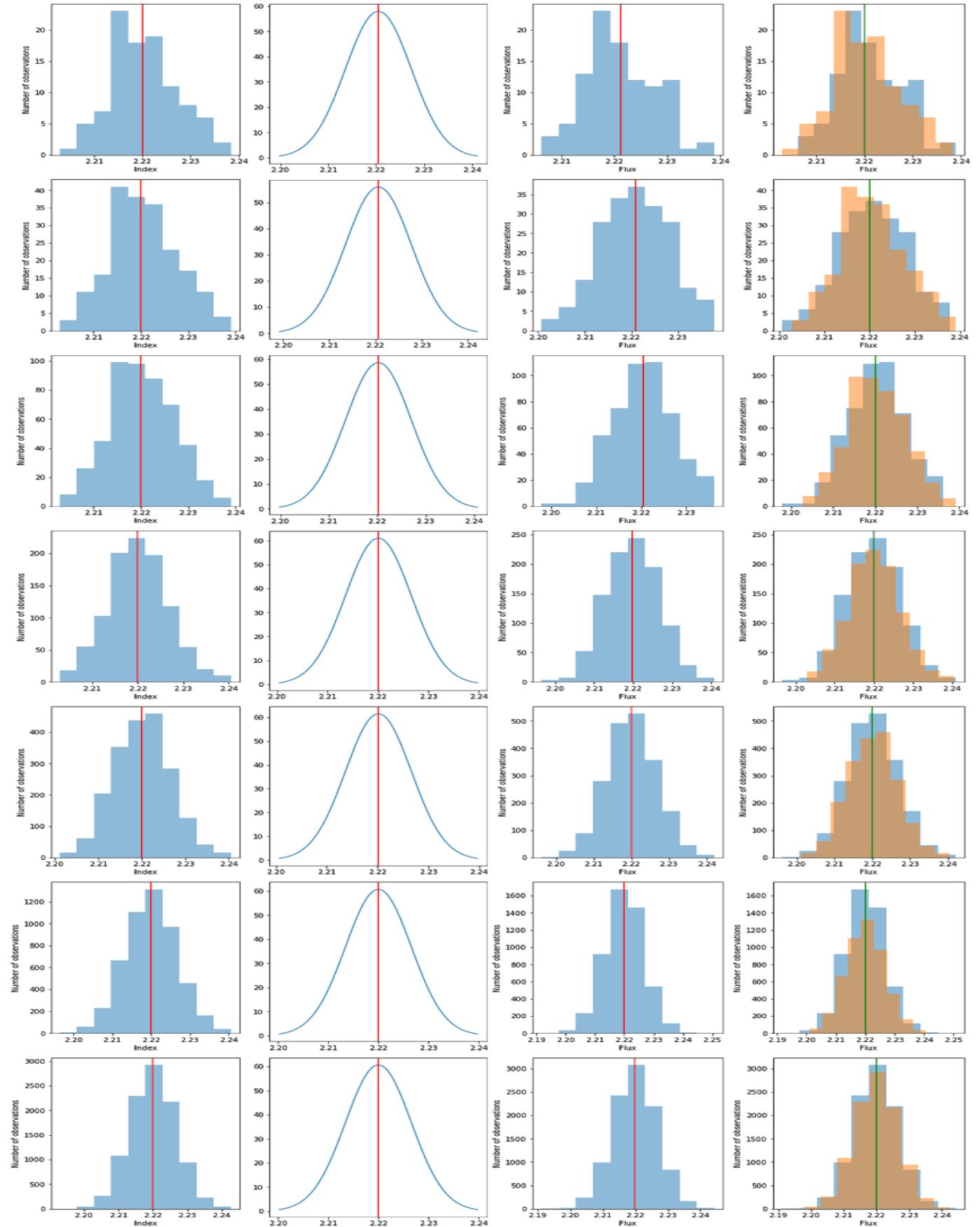


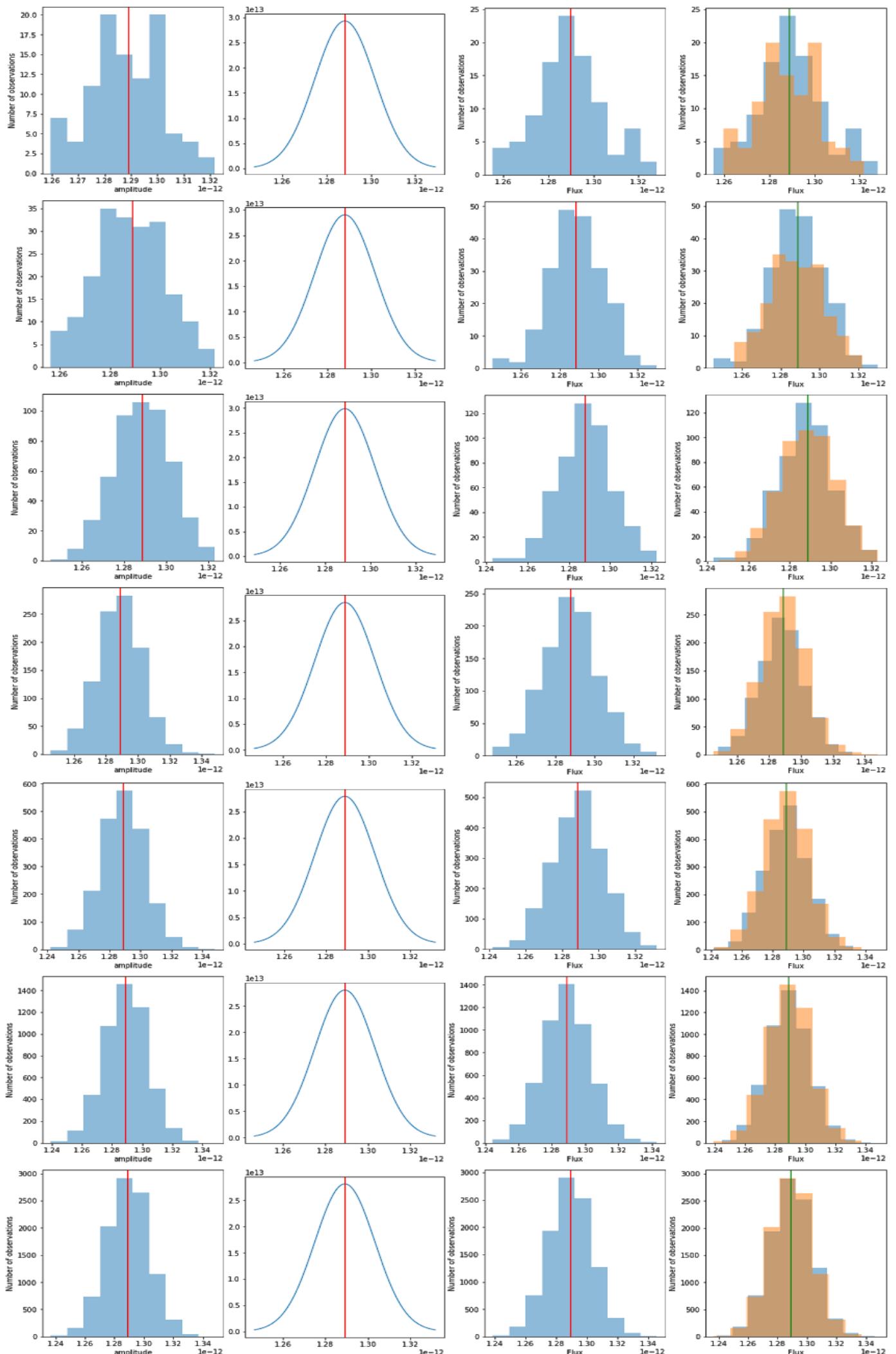


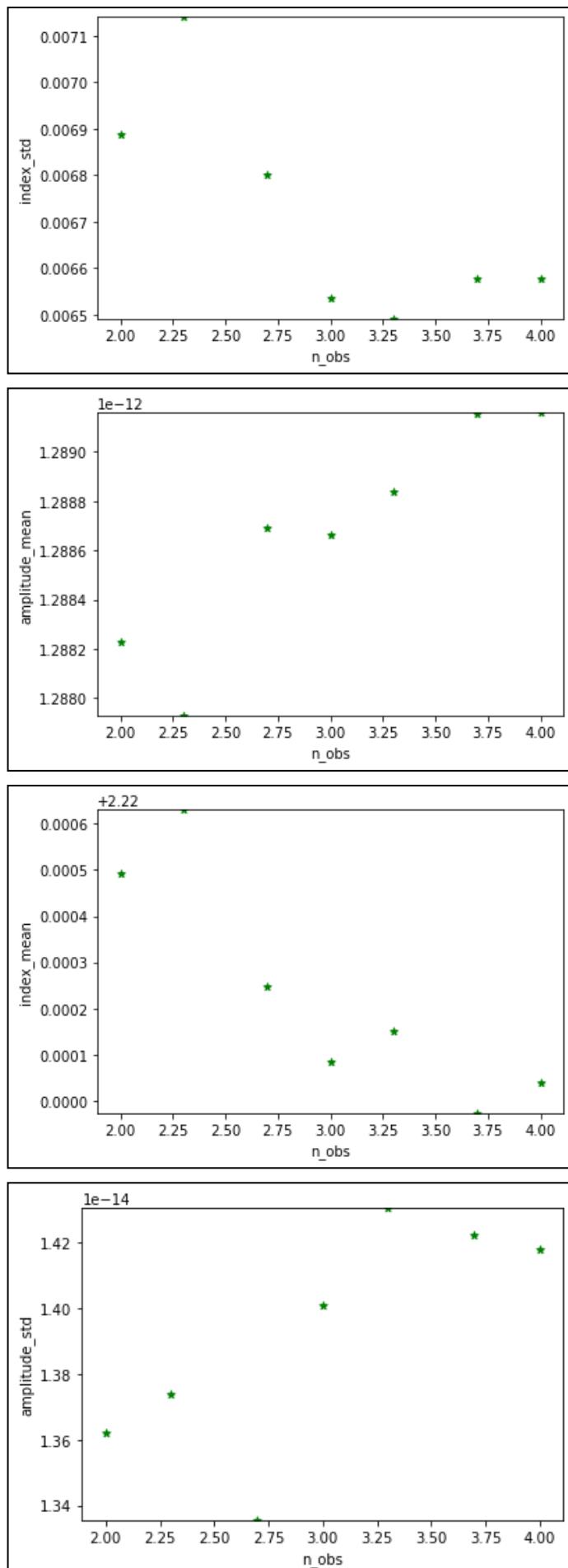


Comparision with different number of observations:

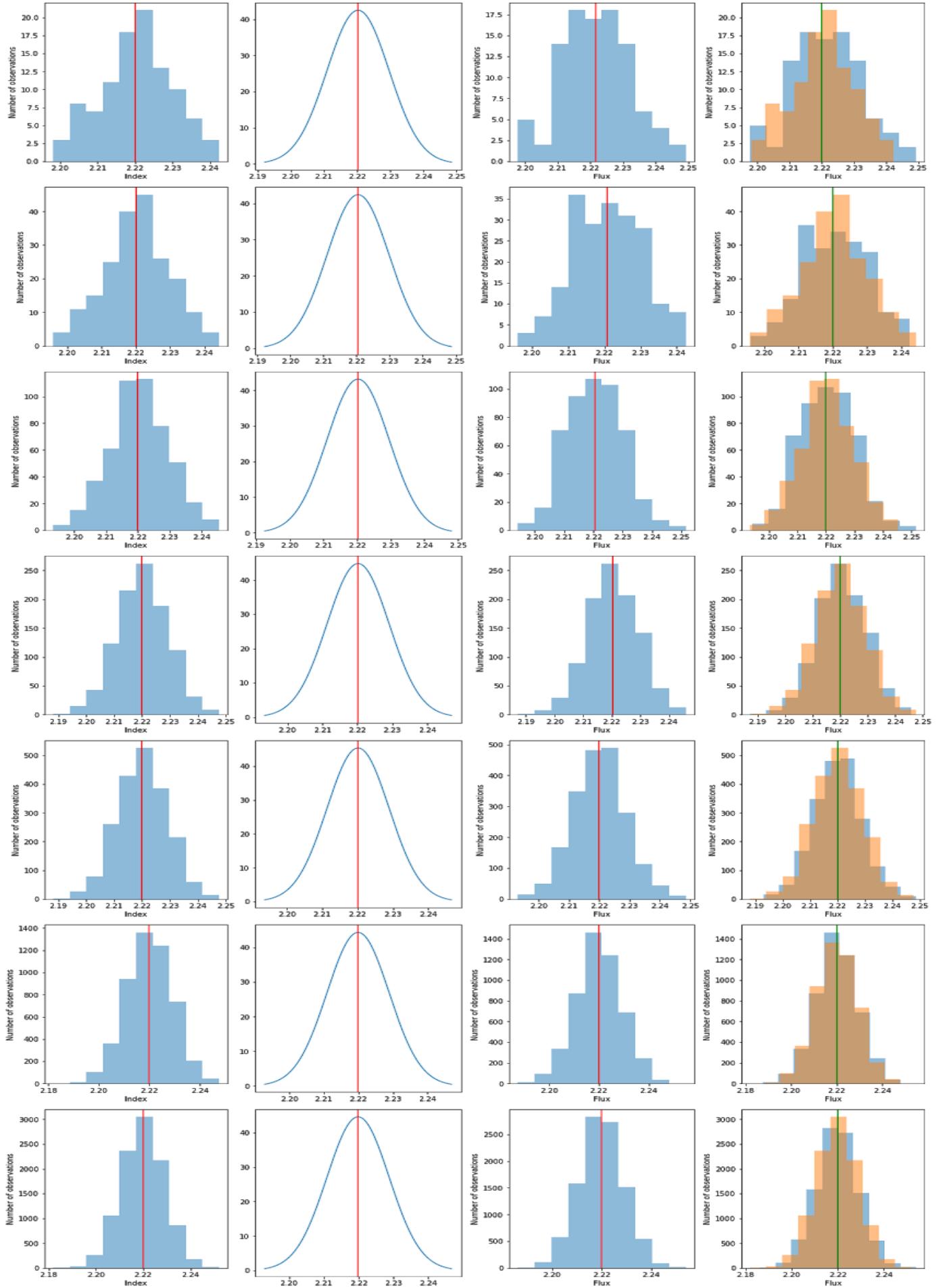
PowerLaw:

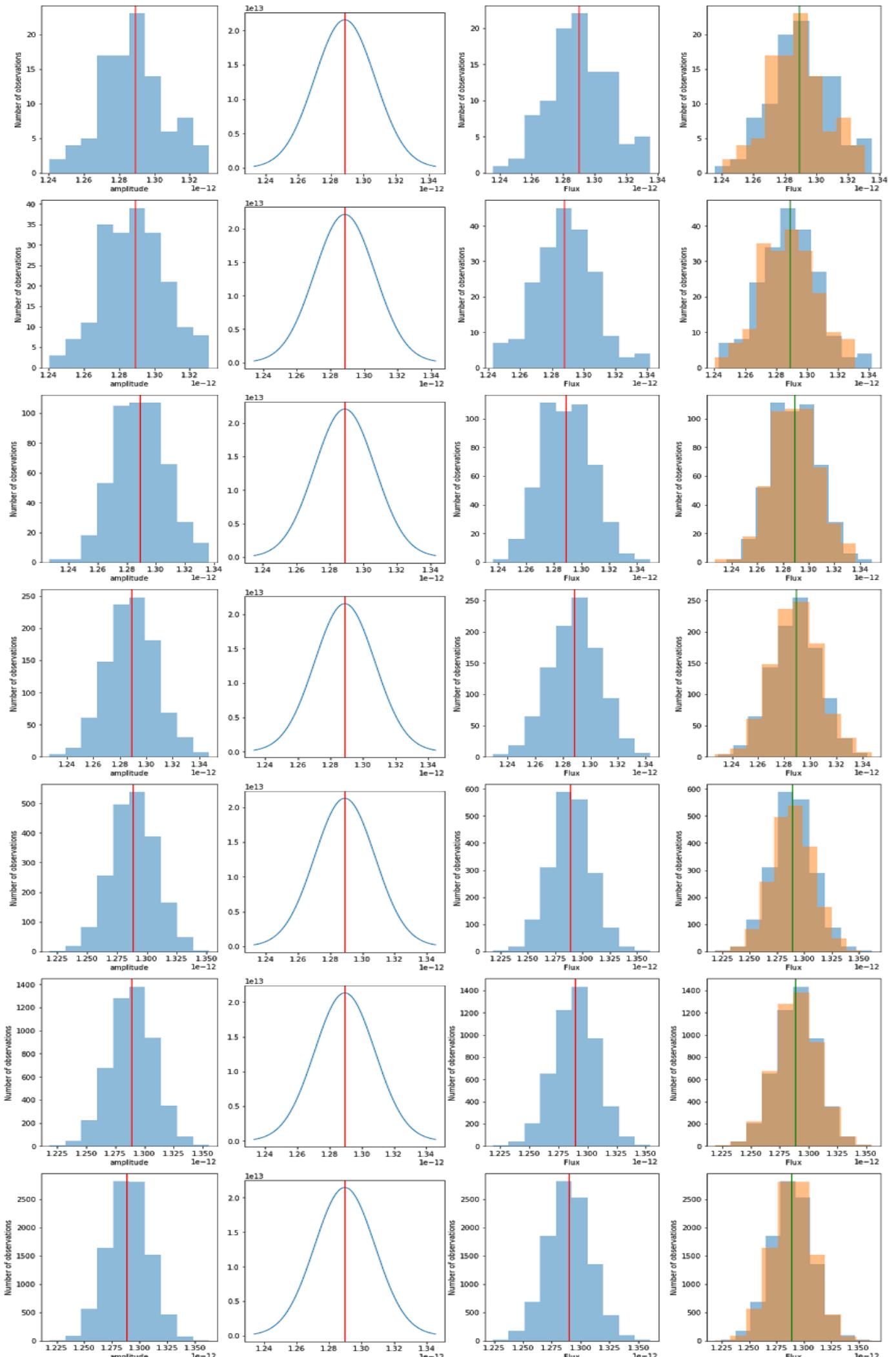


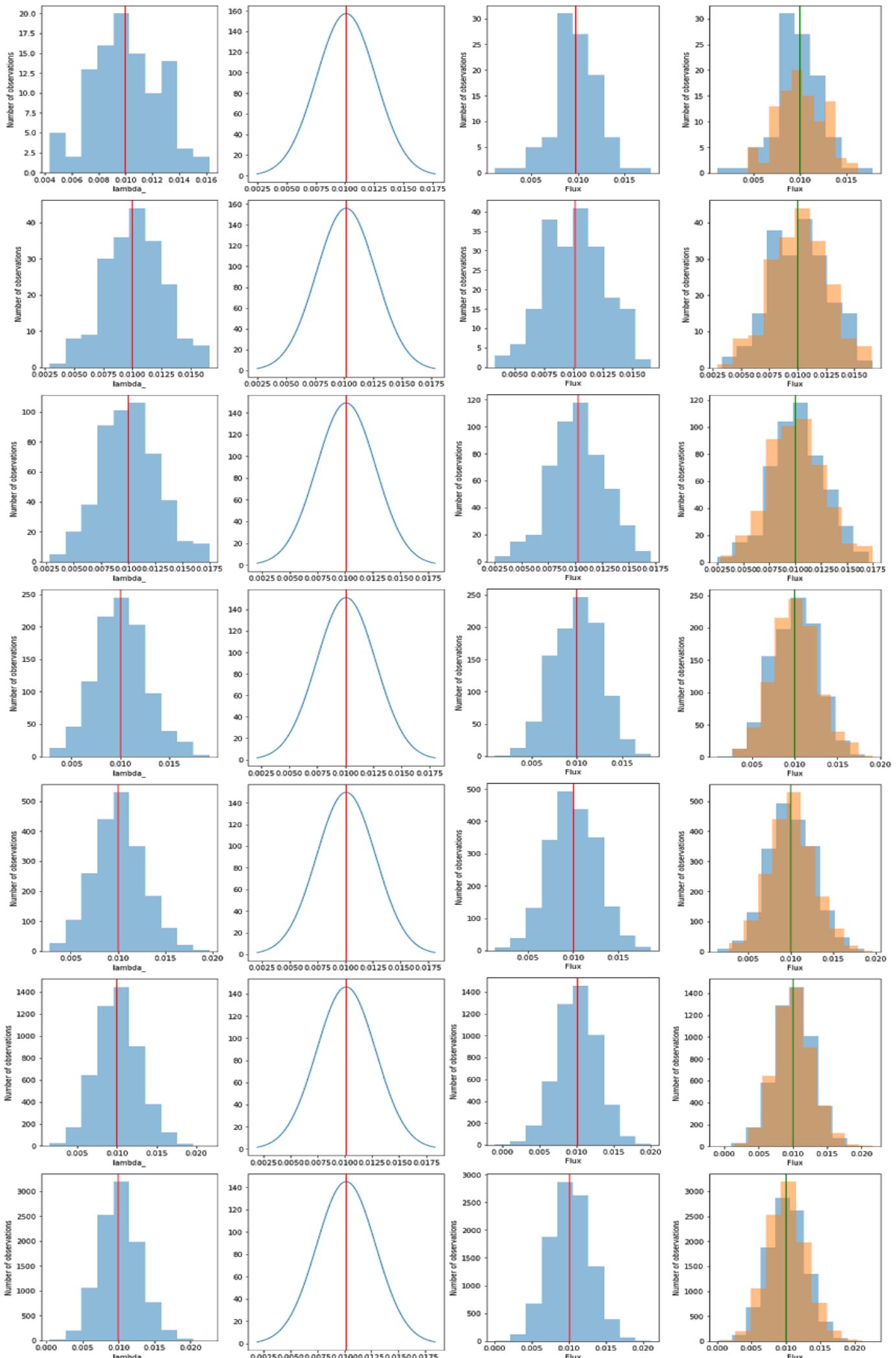


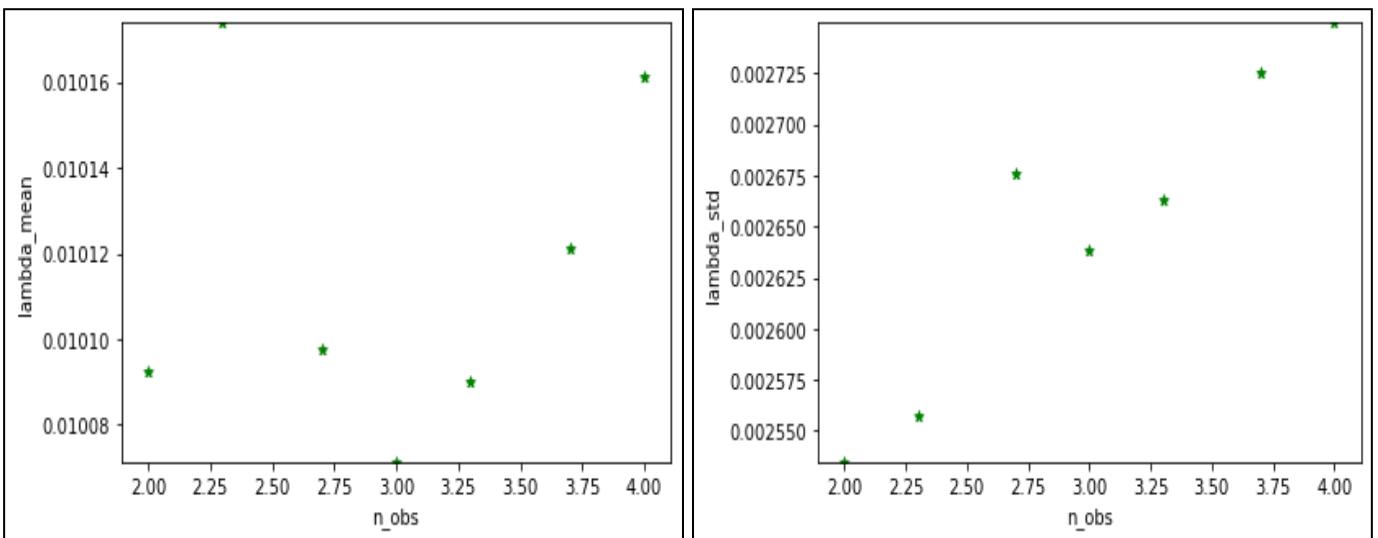
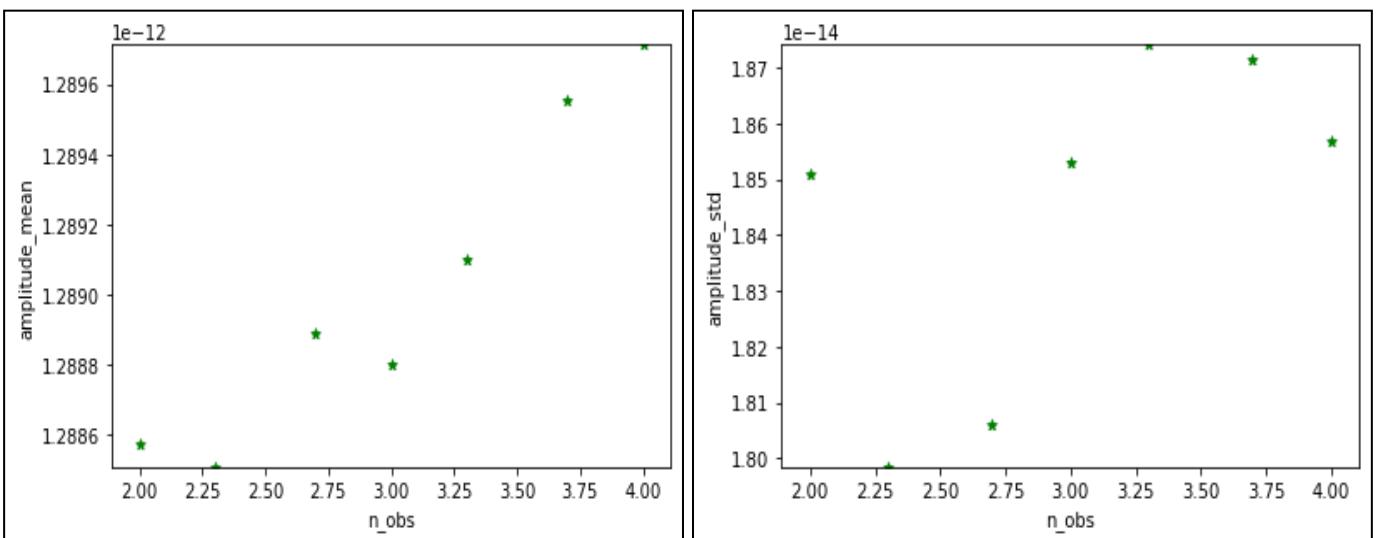
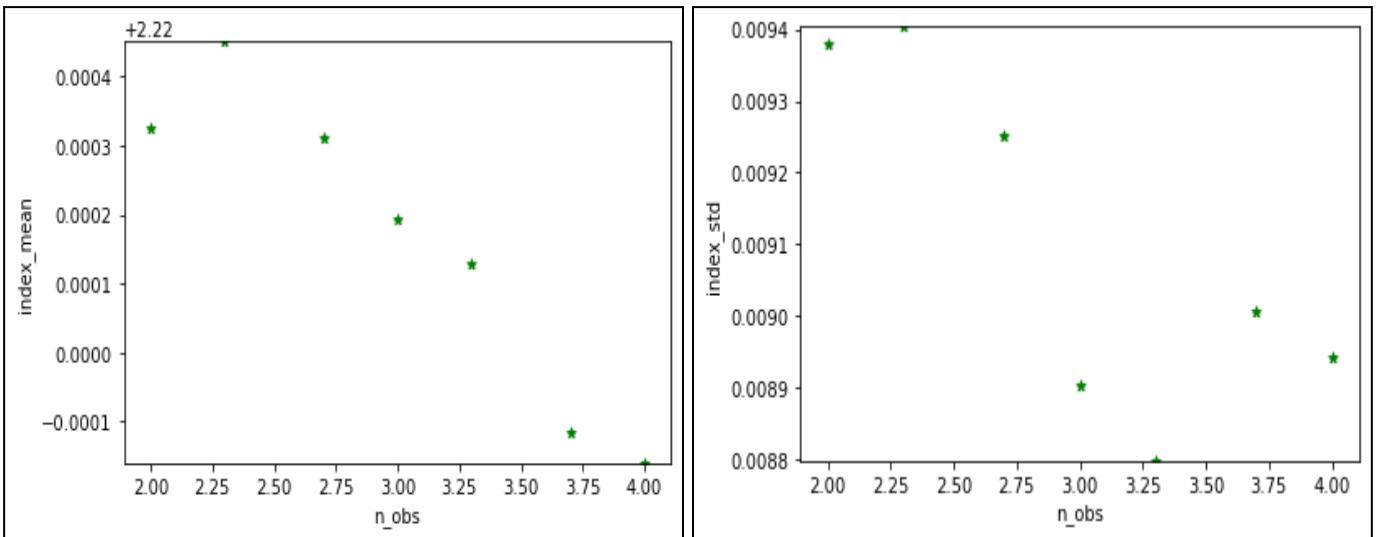


Exponentialcut-Powerlaw ($\Gamma = 0.01$):

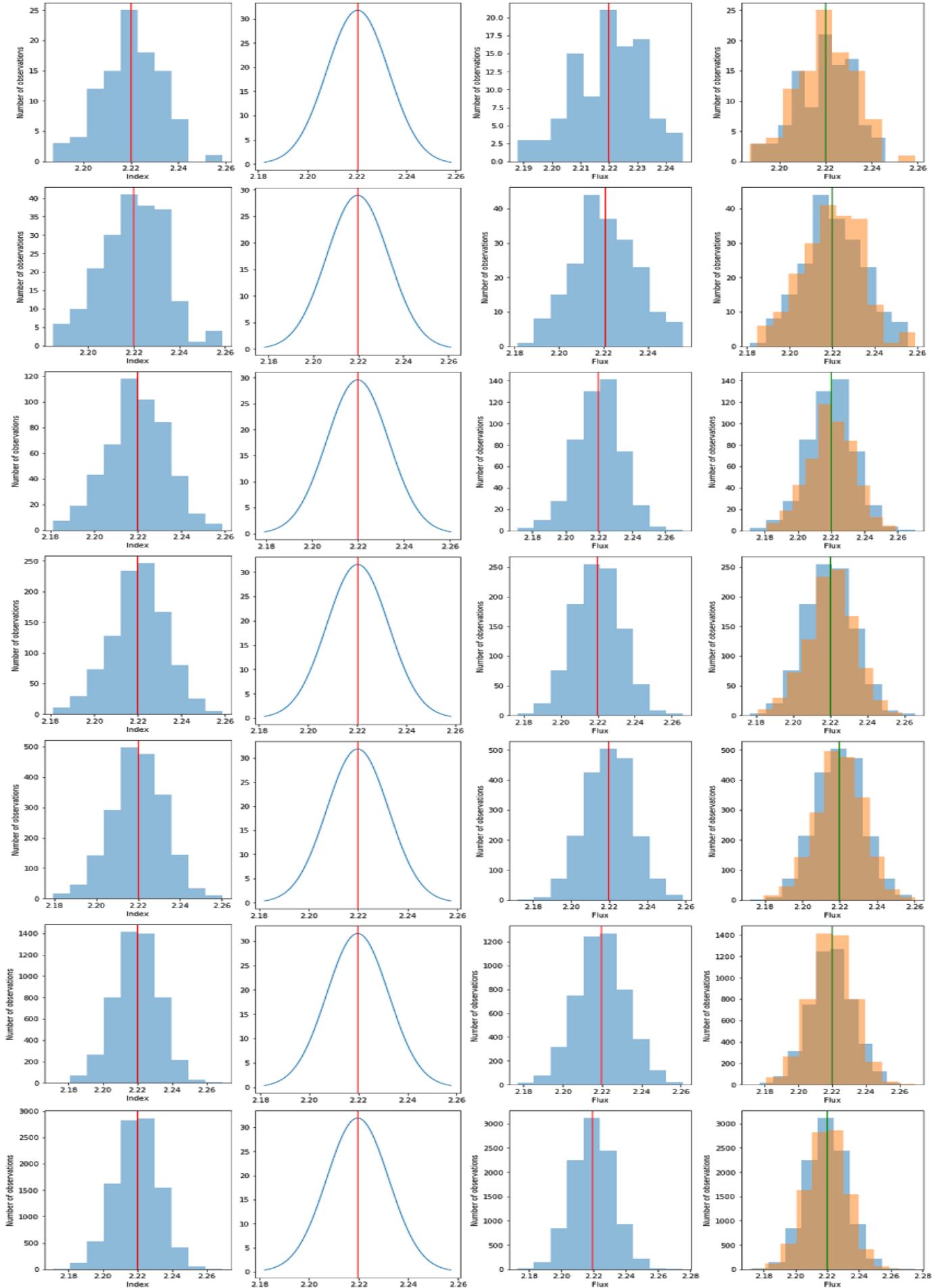


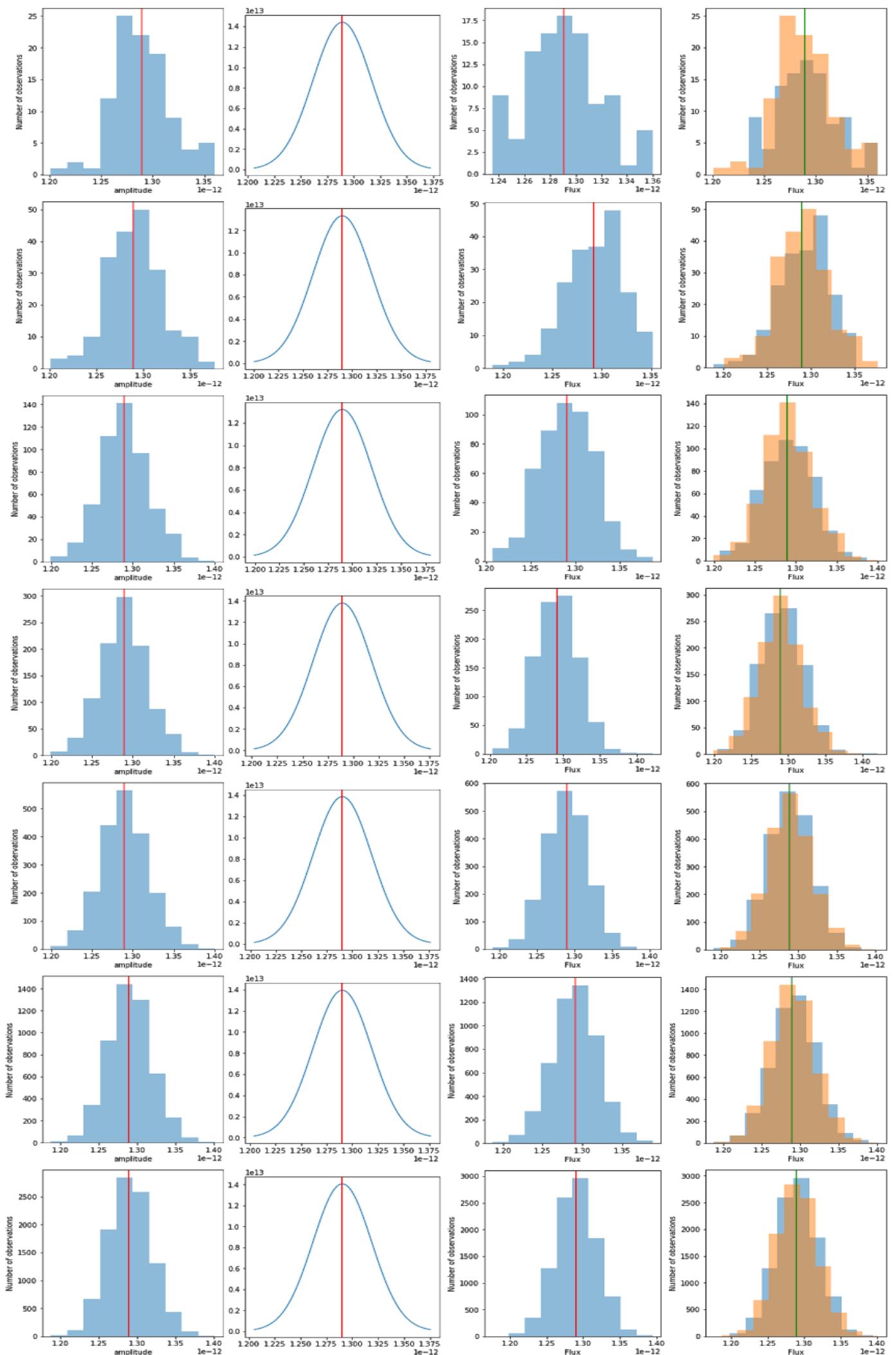


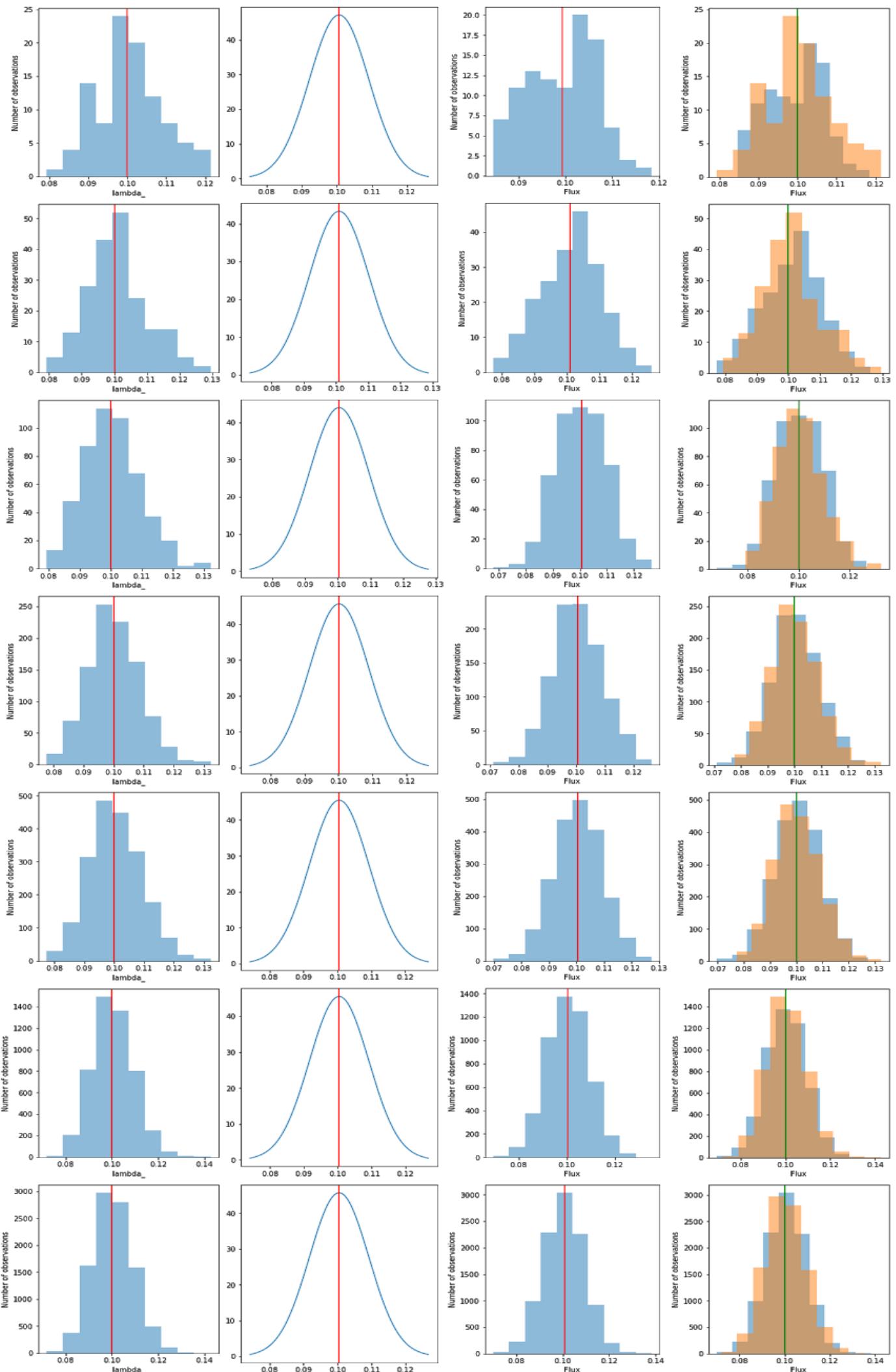


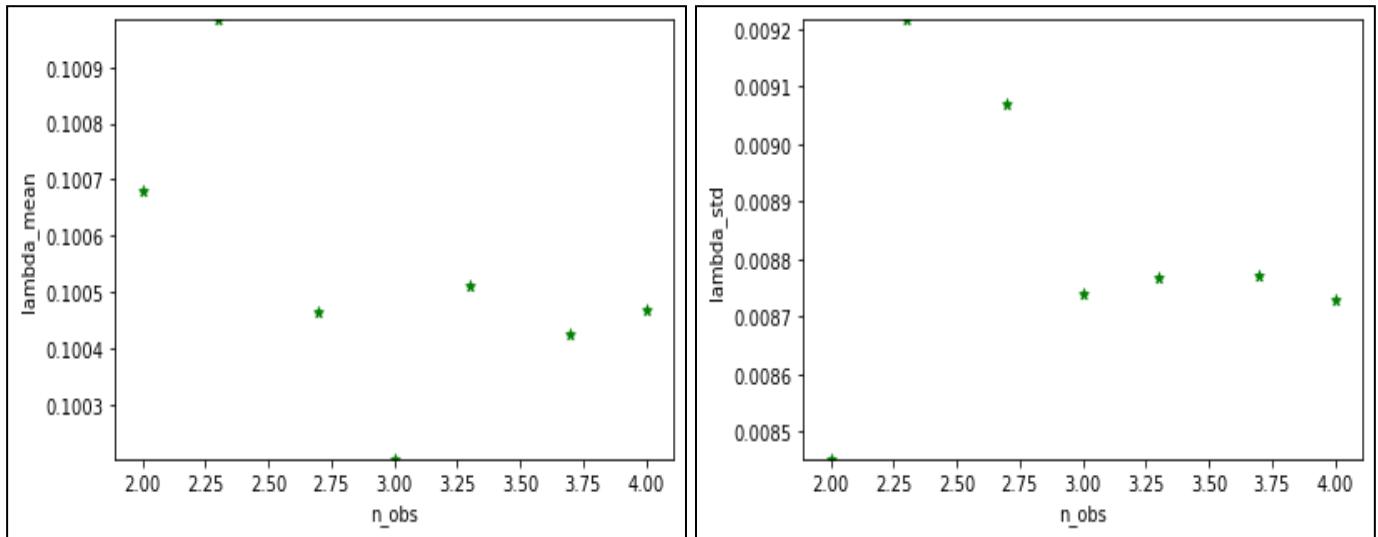
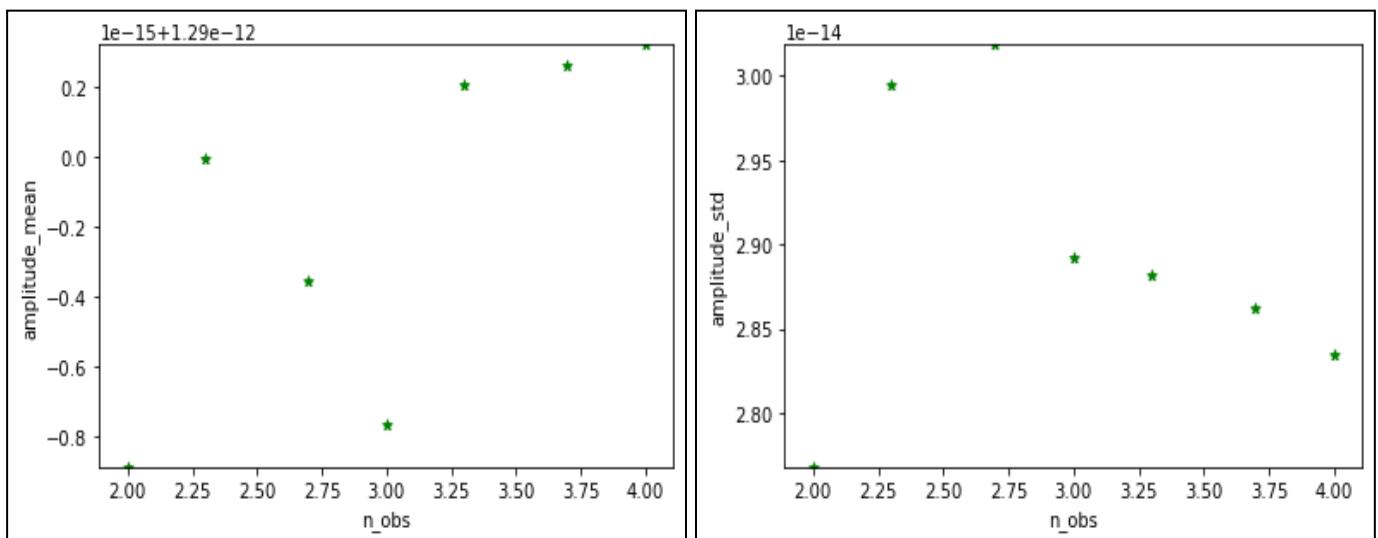
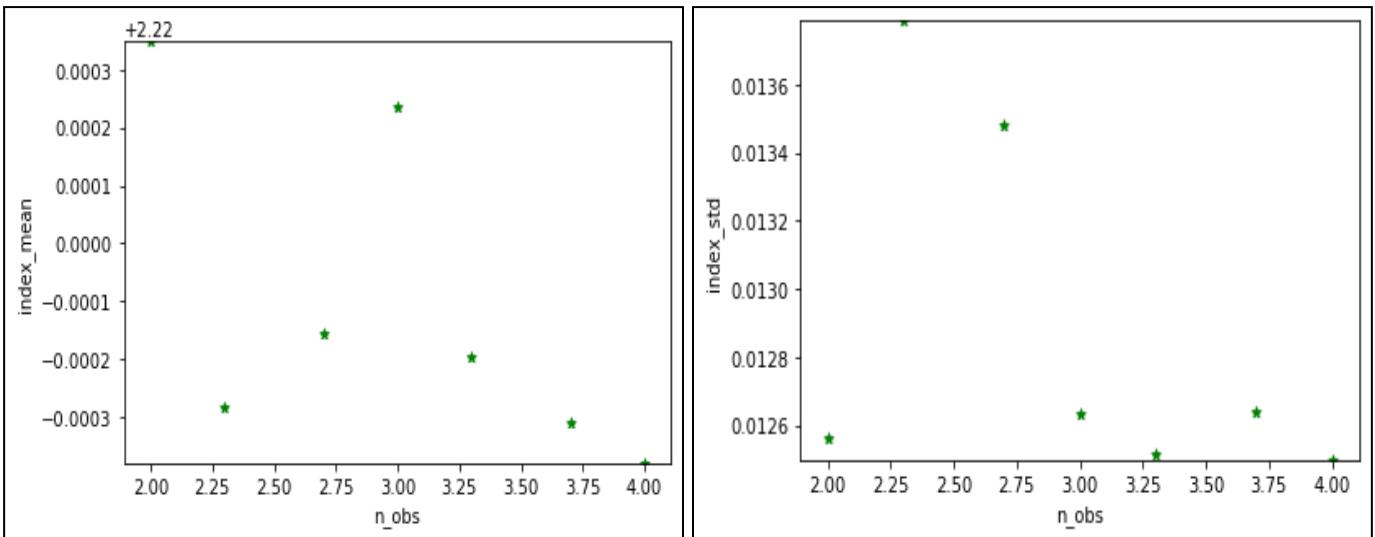


Exponentialcut-Powerlaw ($\Gamma = 0.1$):

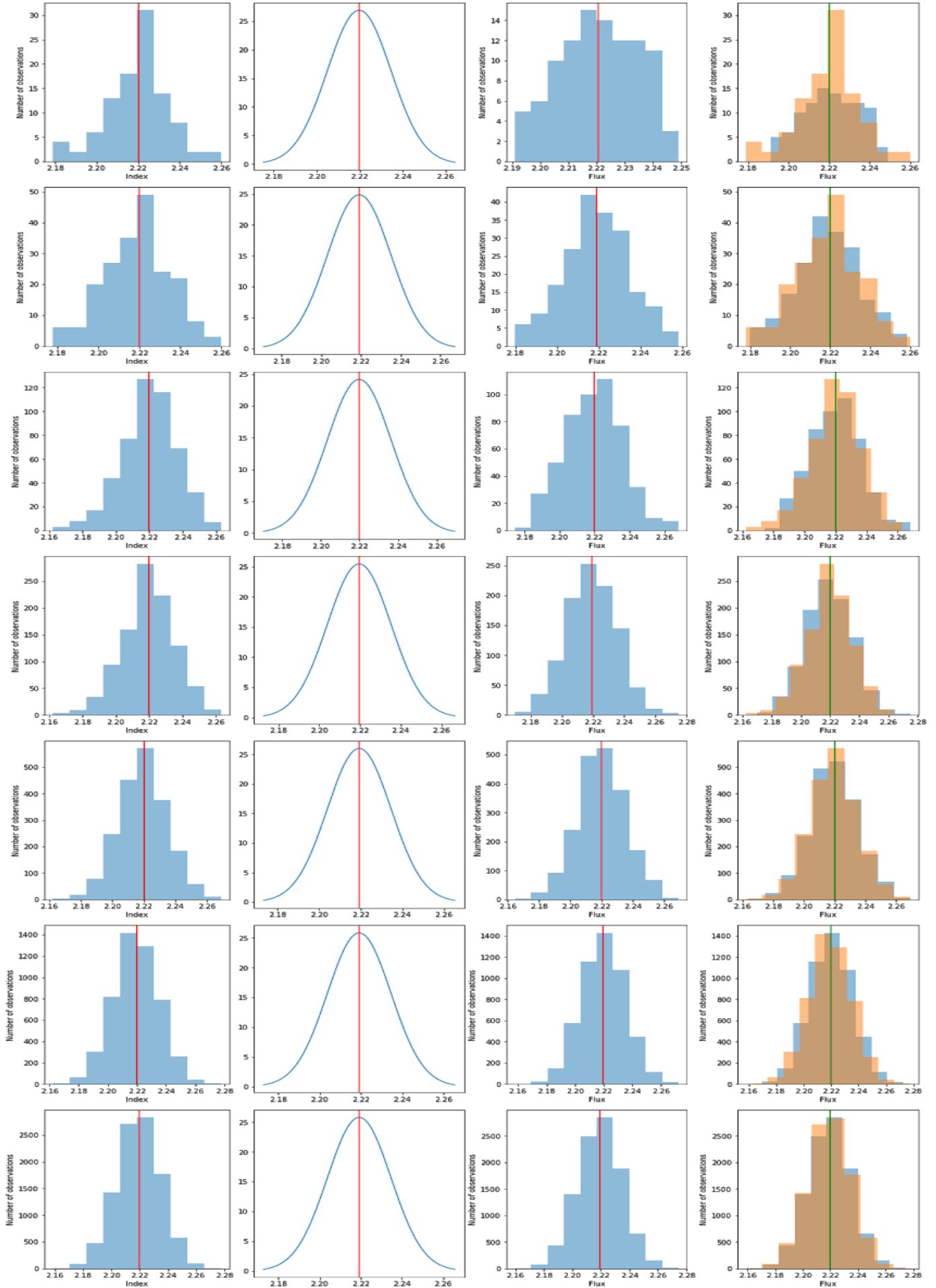


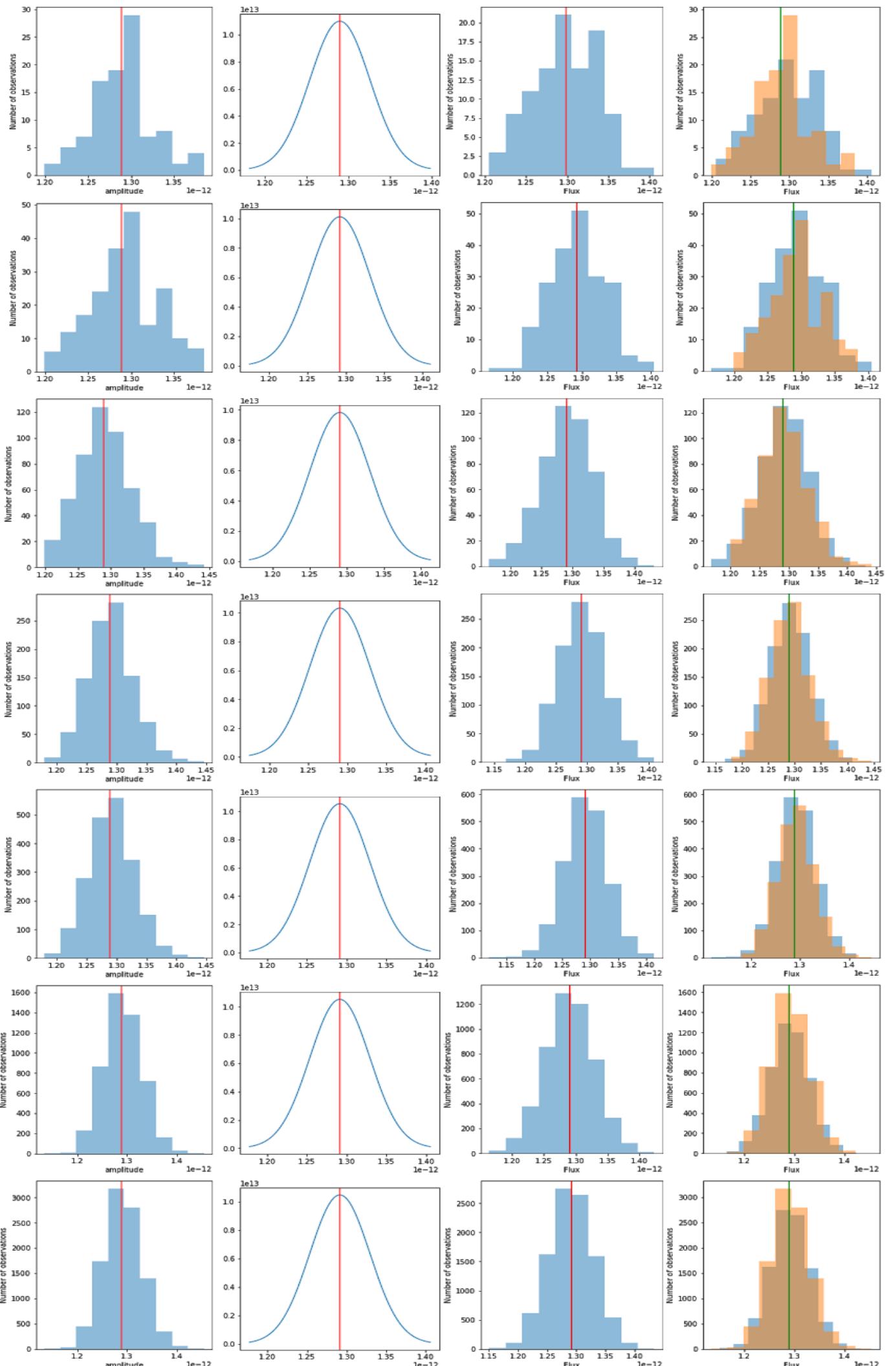


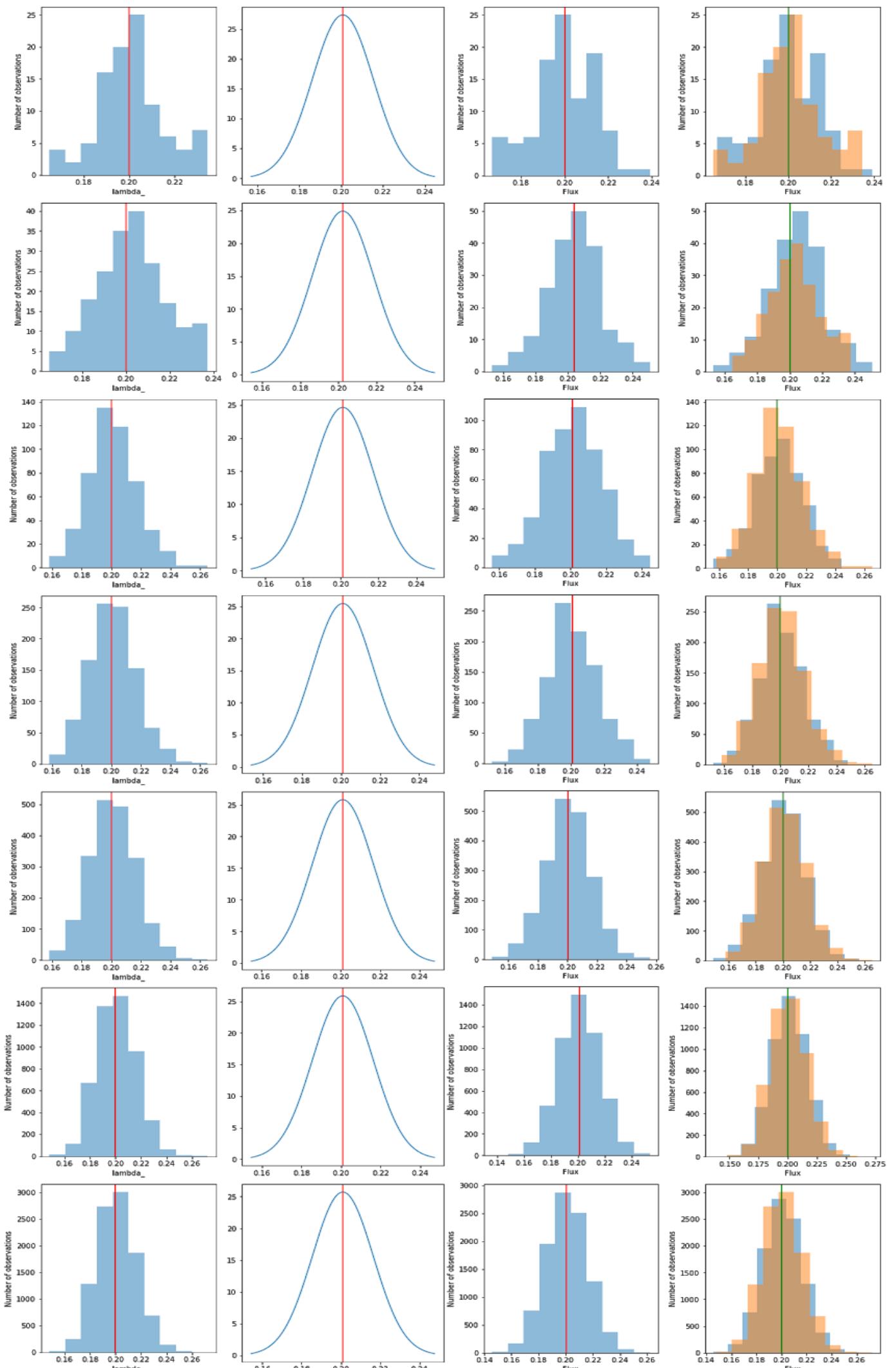


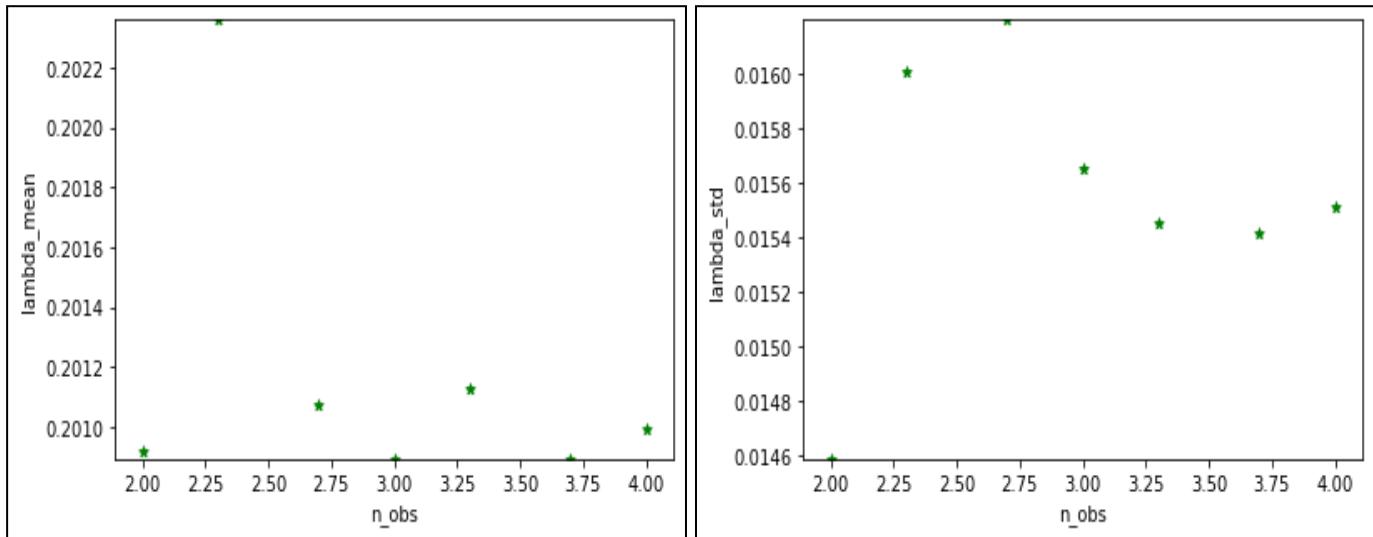
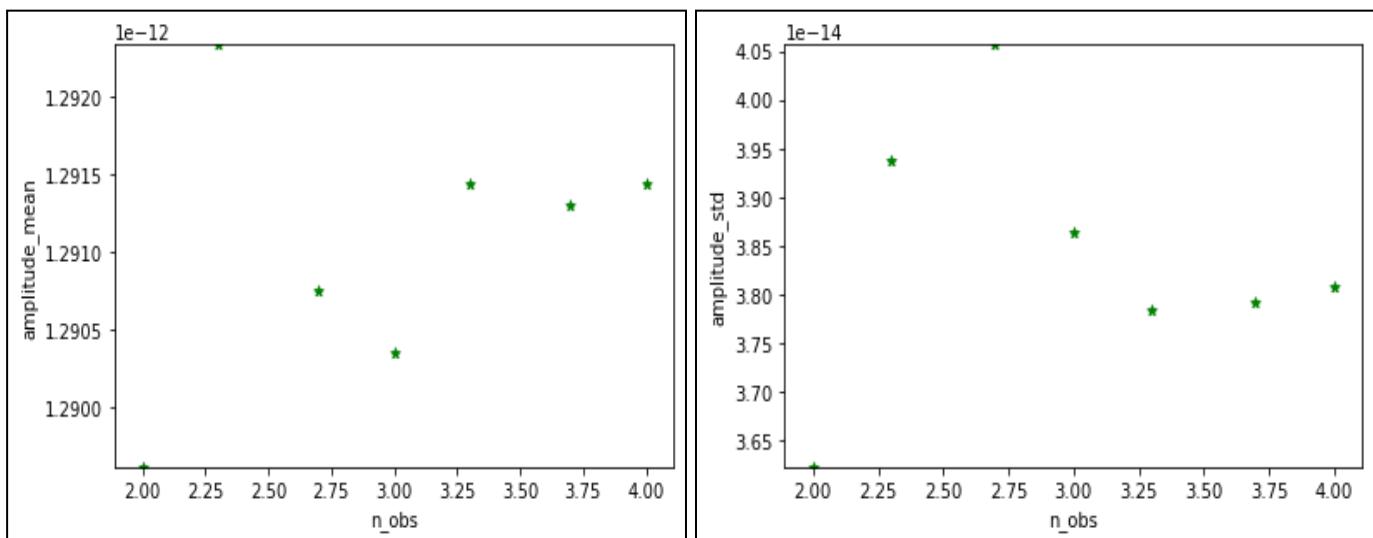
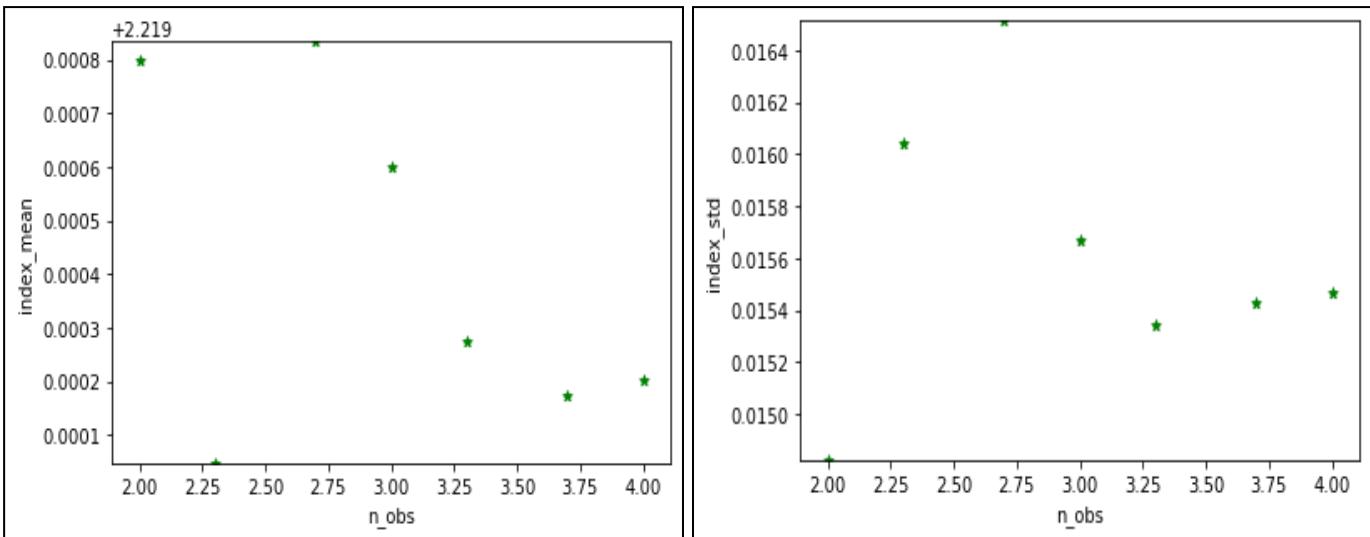


Exponentialcut-Powerlaw ($\Gamma = 0.2$):

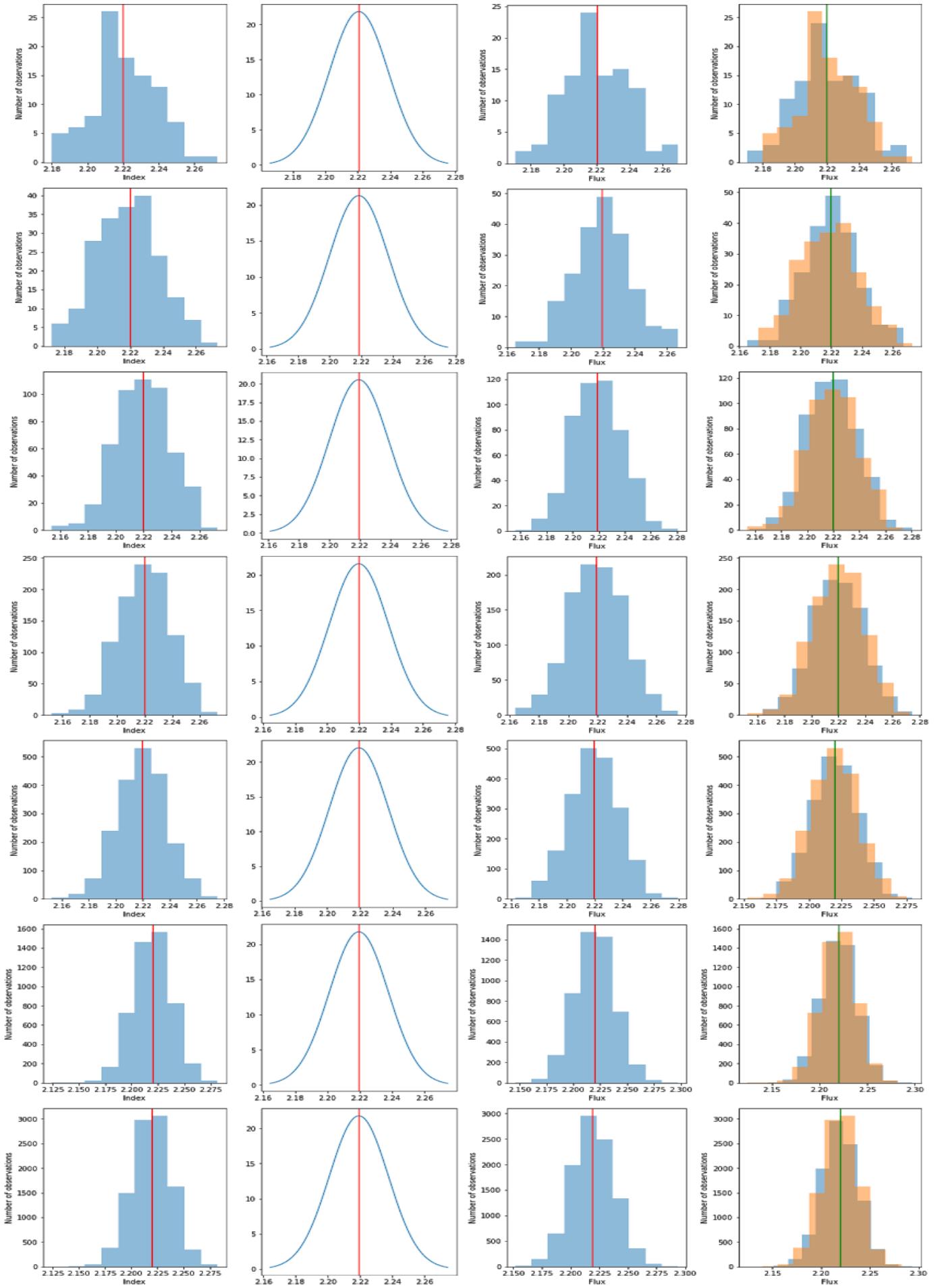


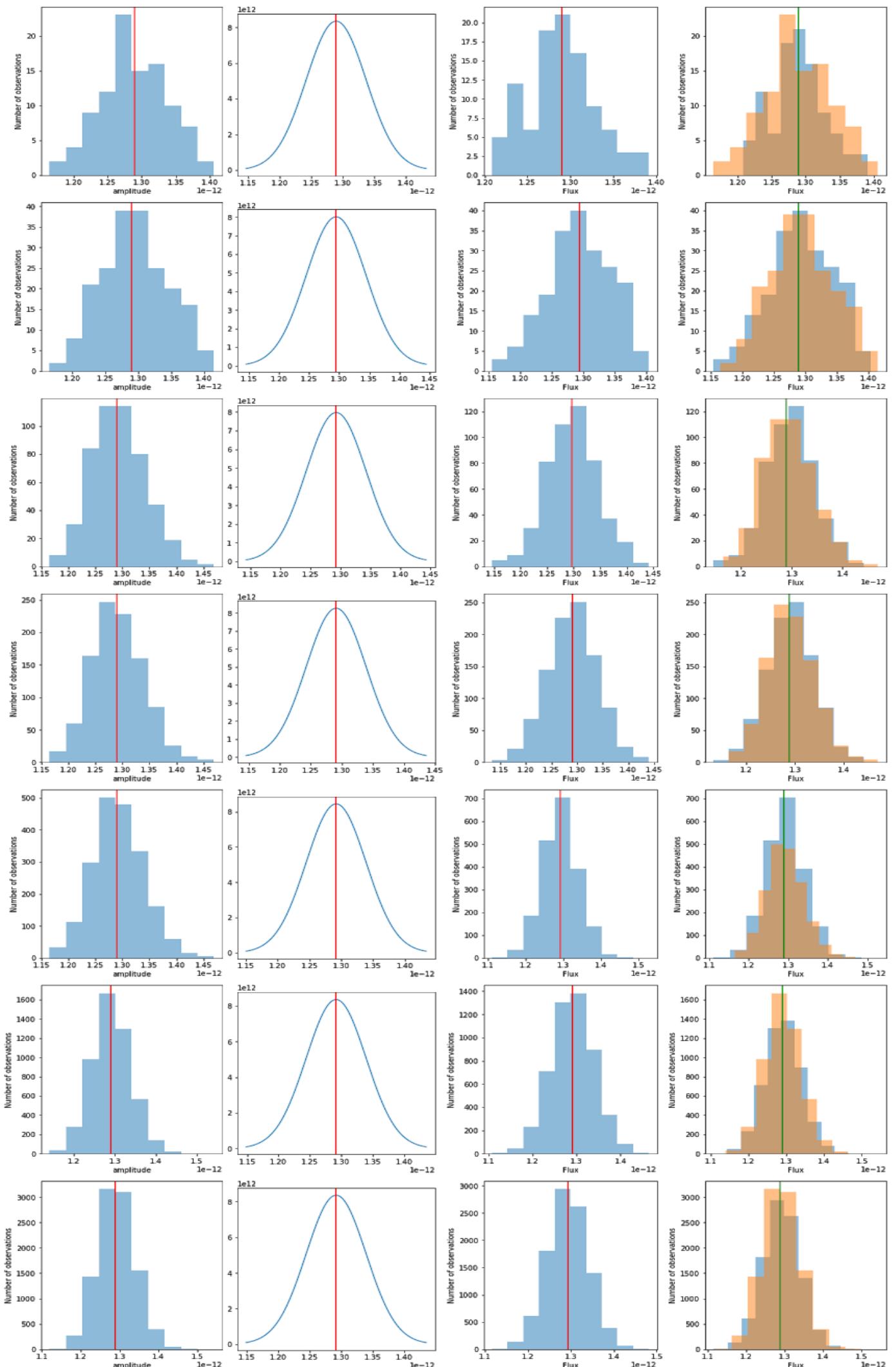


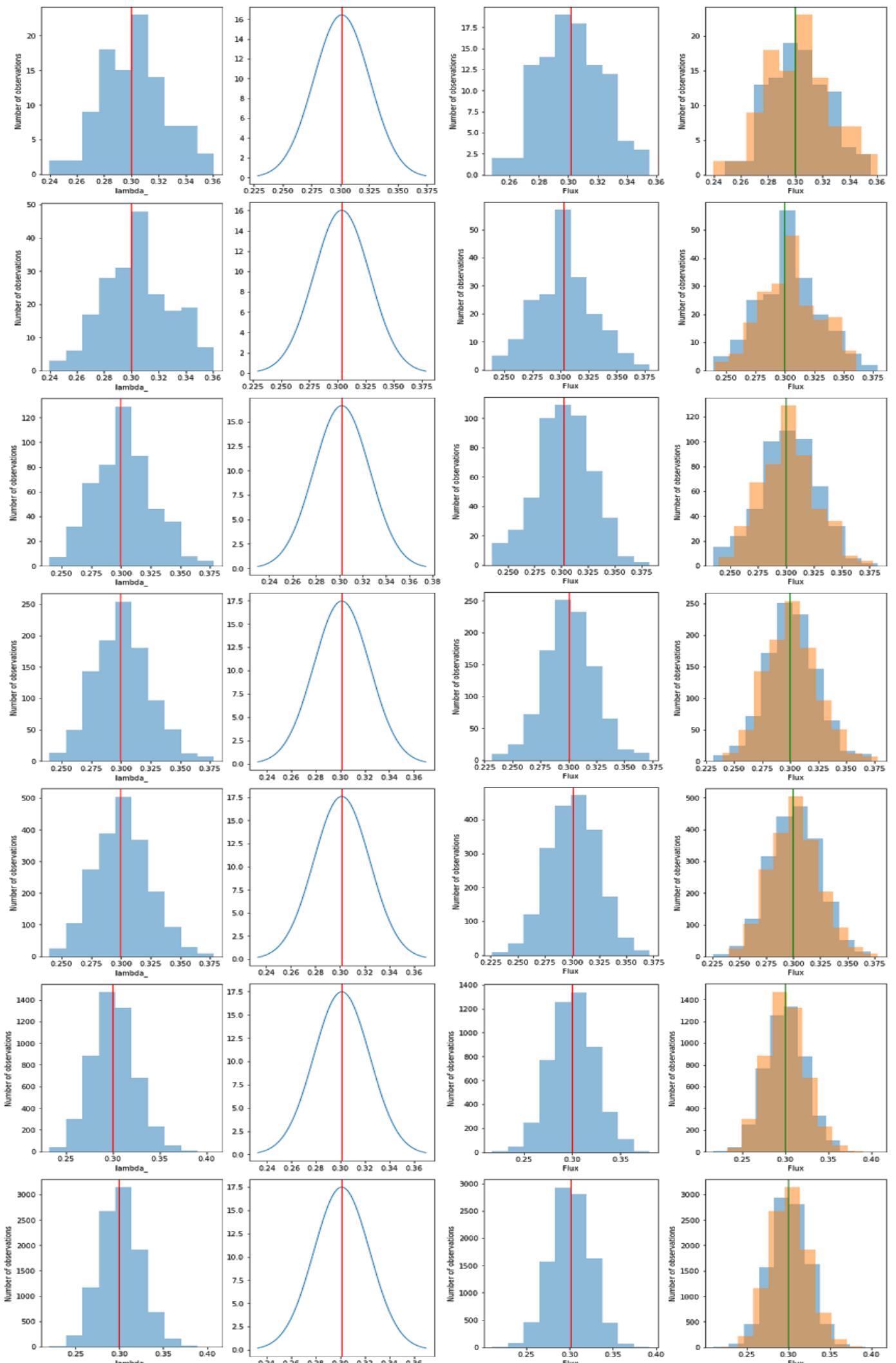


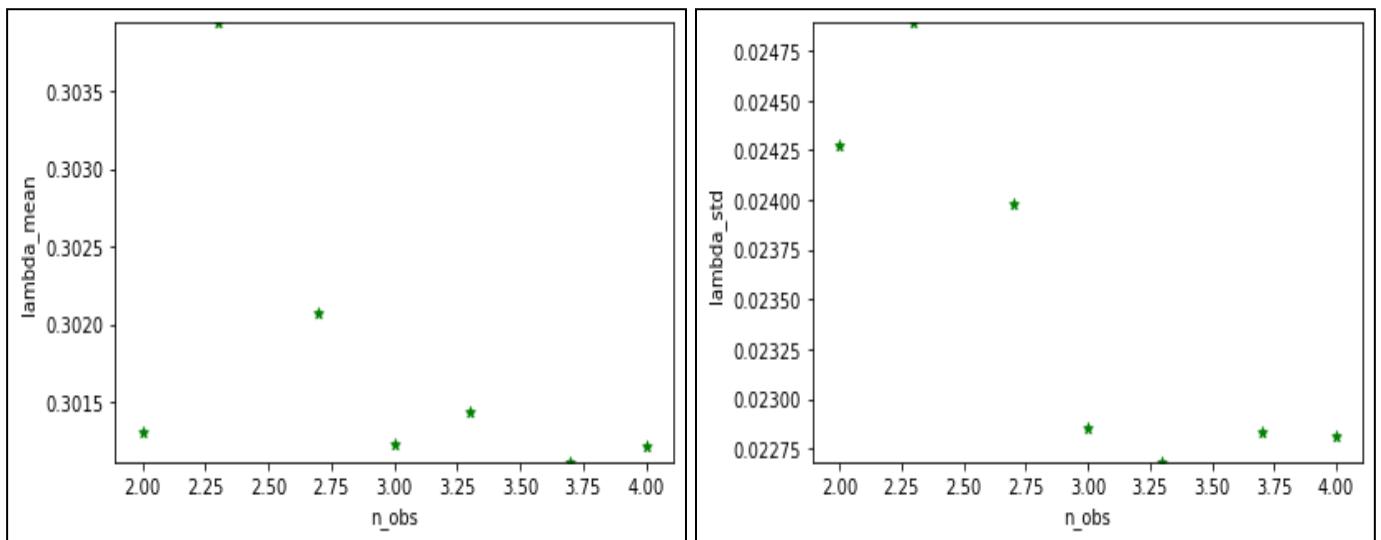
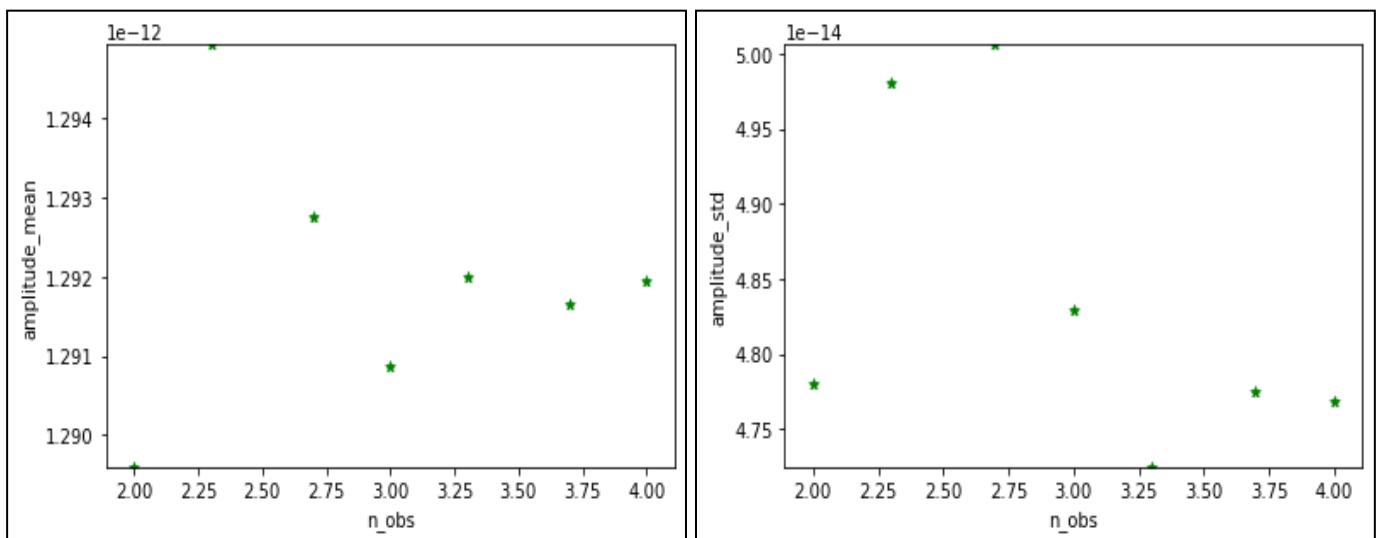
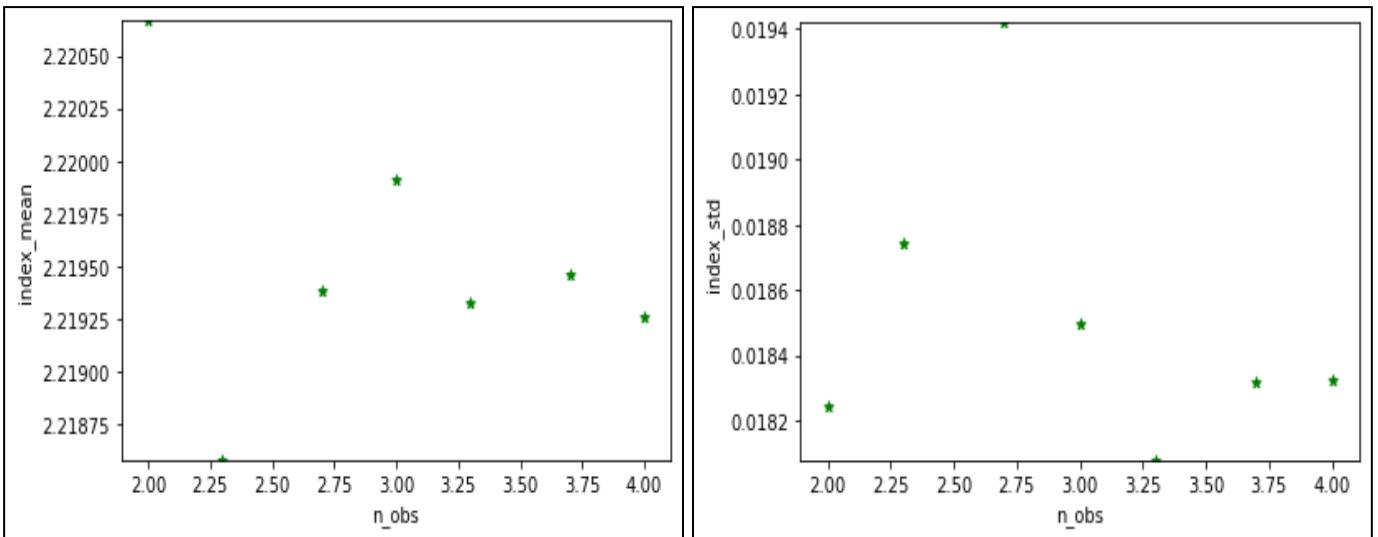


Exponentialcut-Powerlaw ($\Gamma = 0.3$):

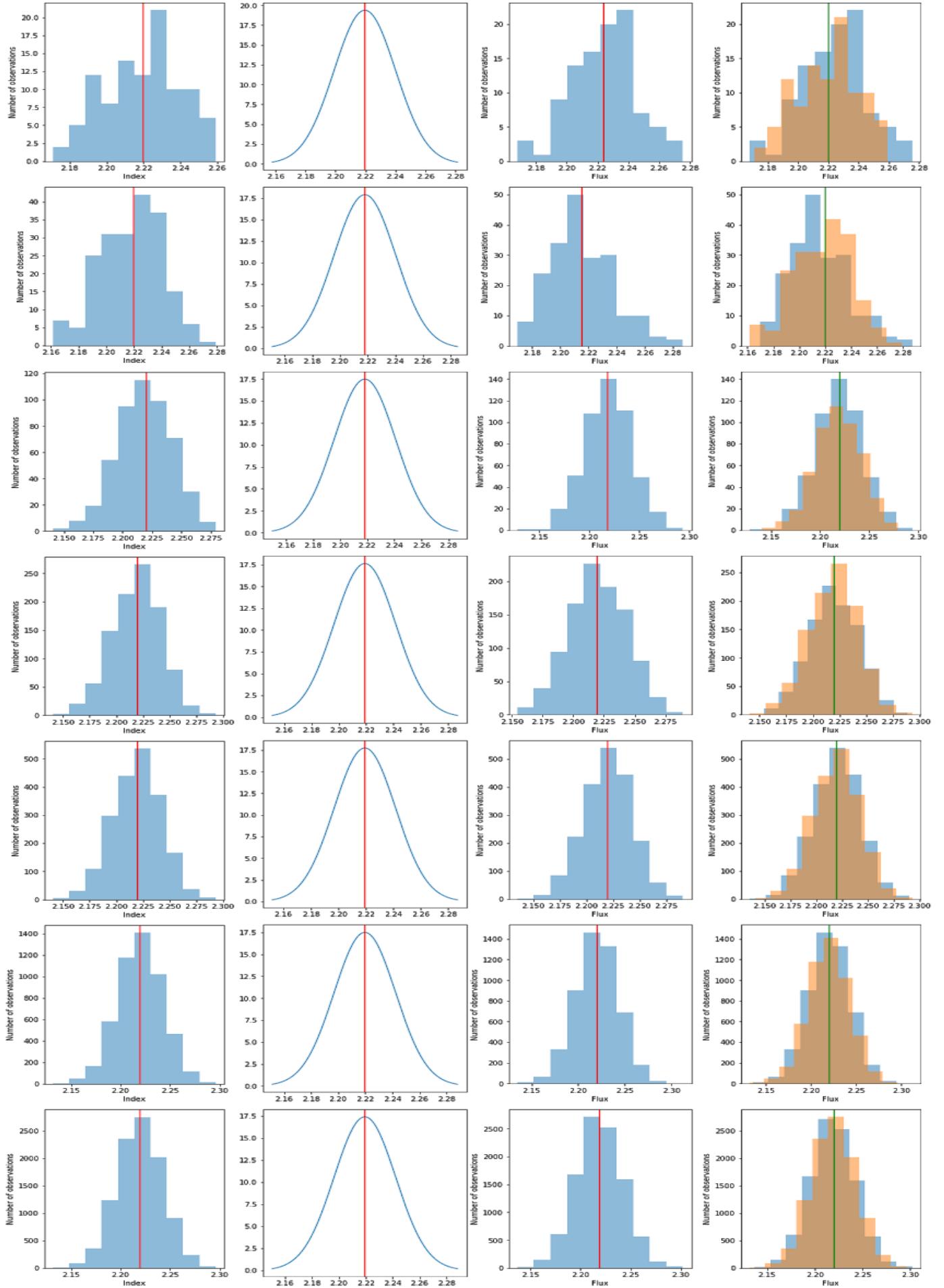


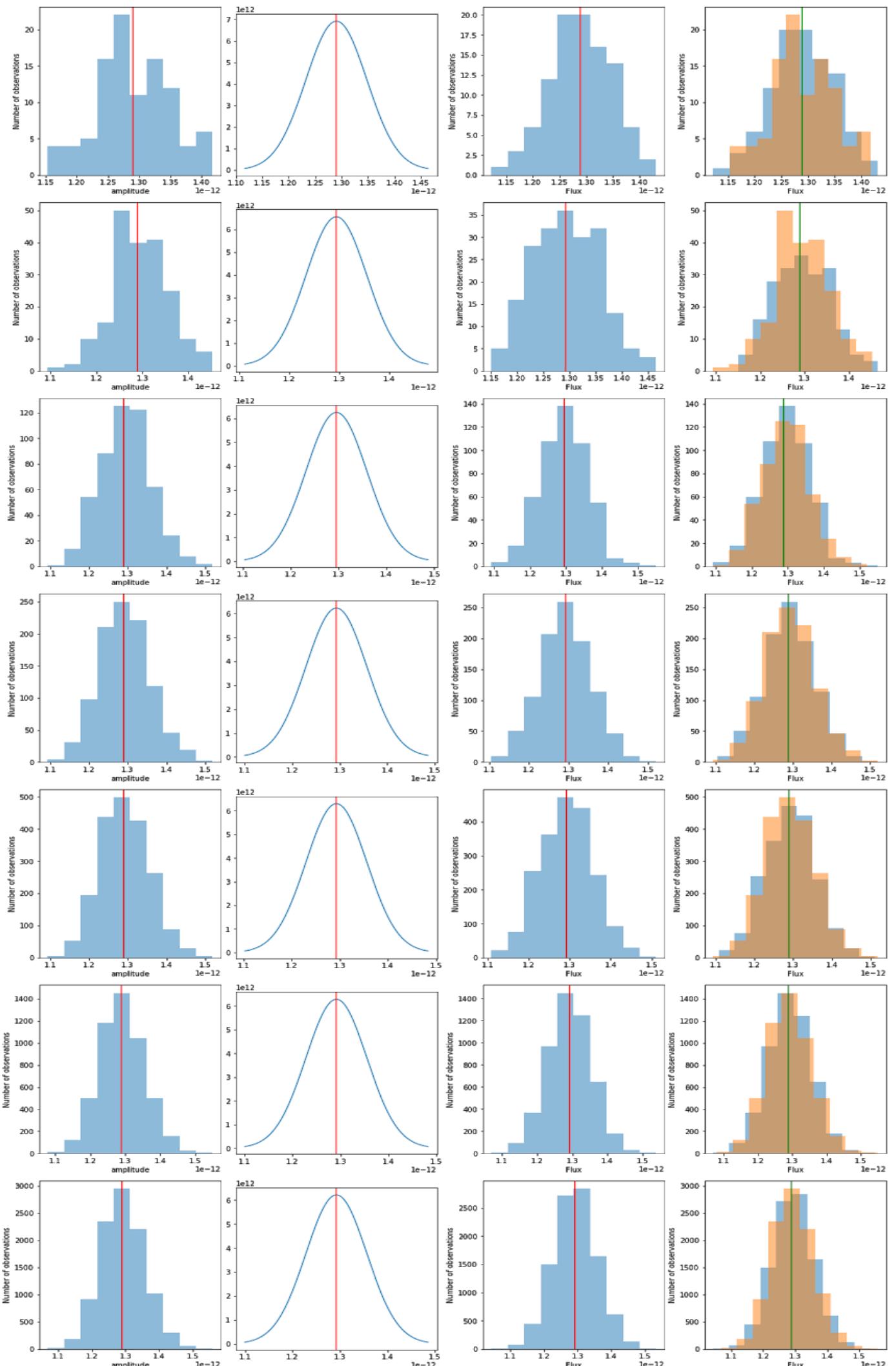


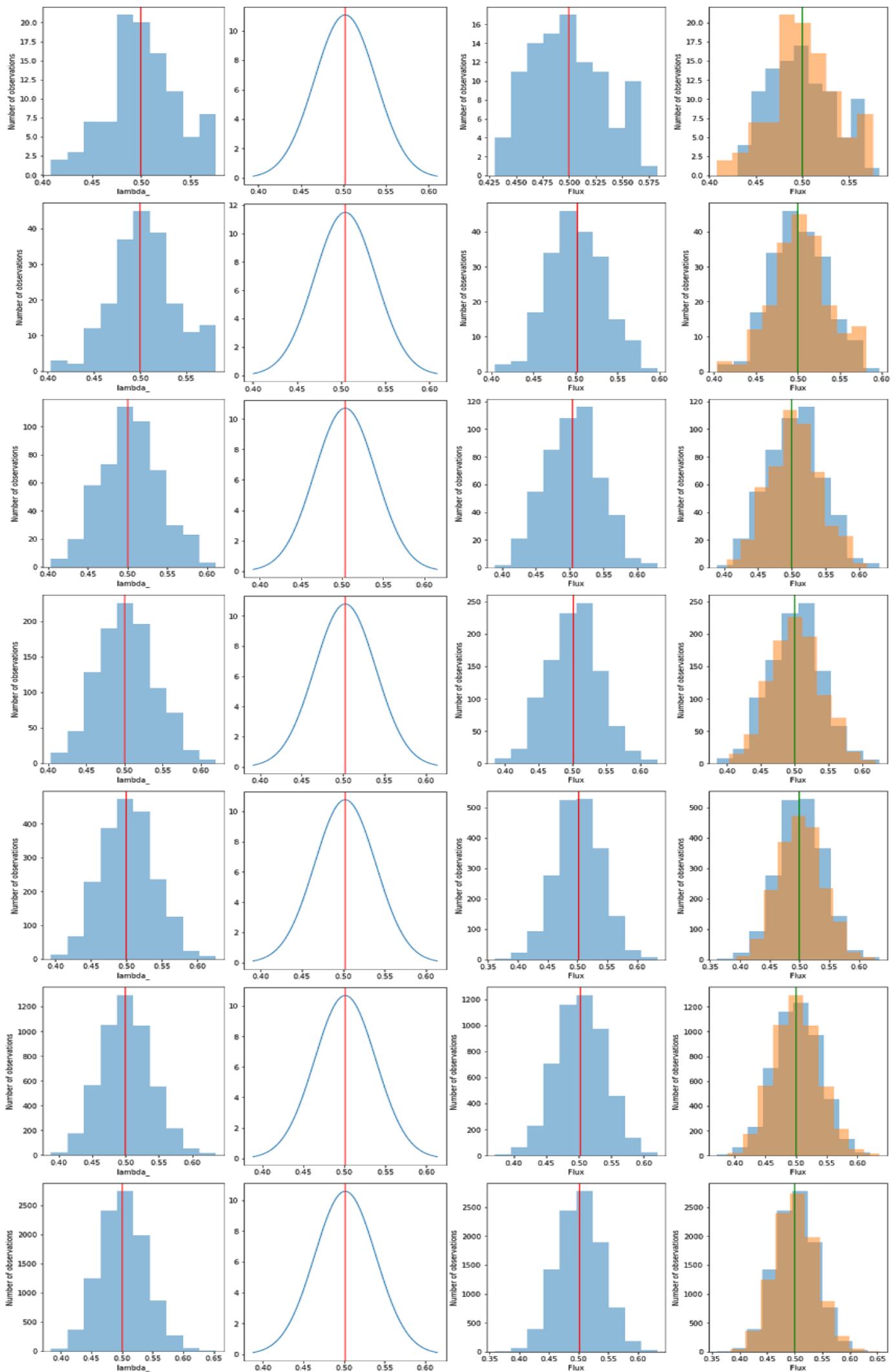


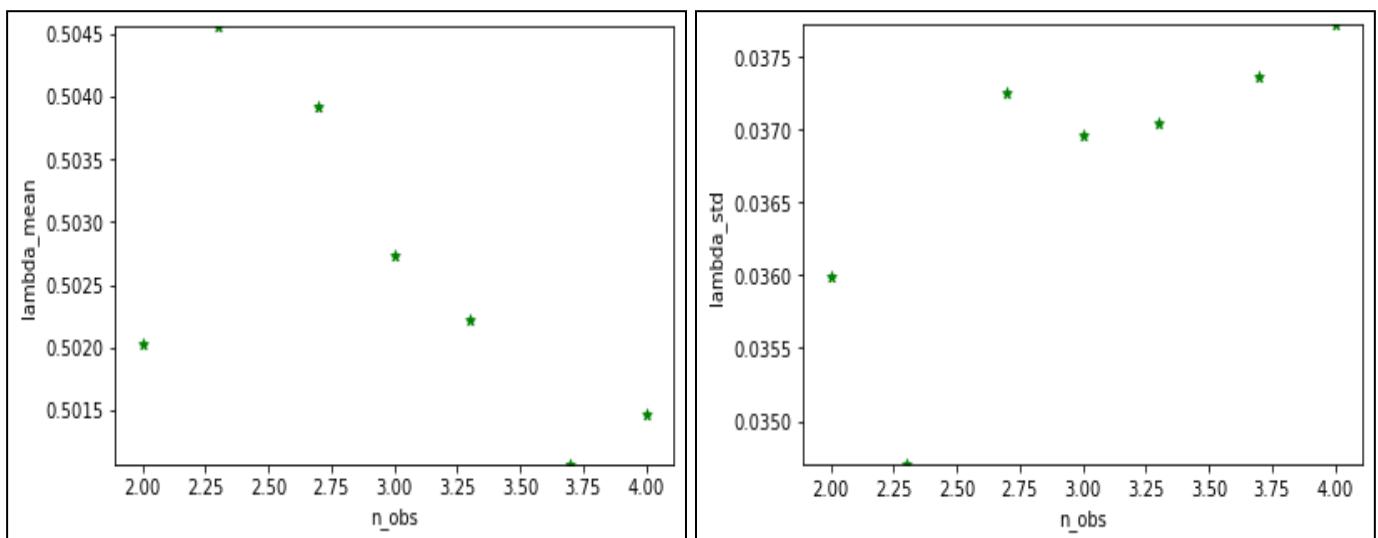
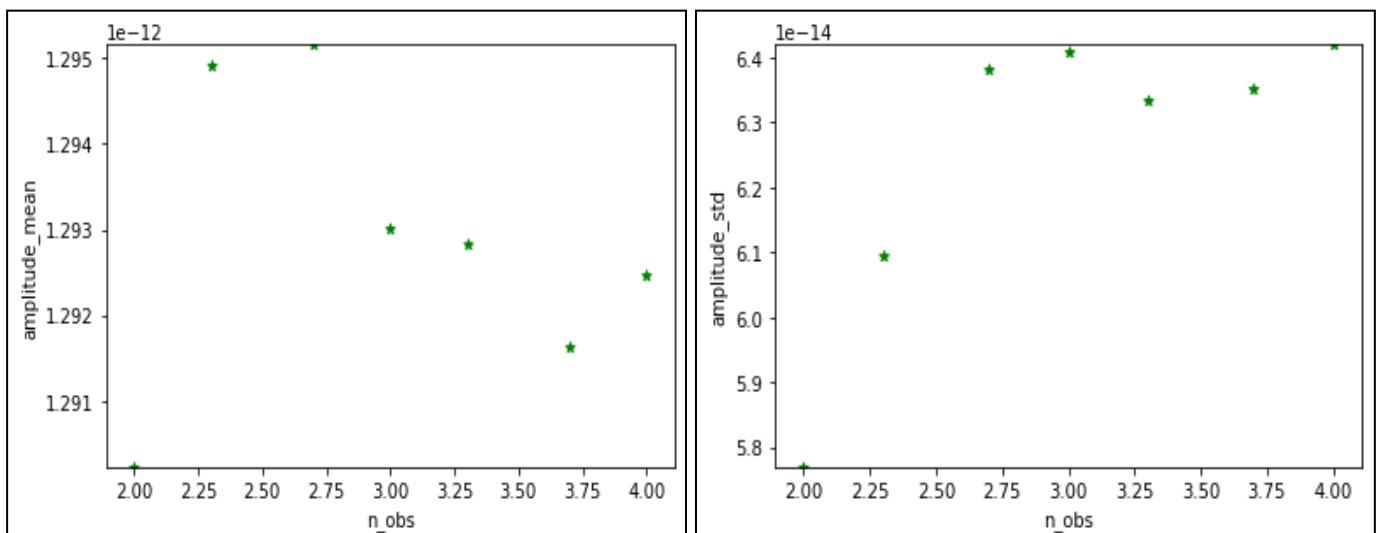
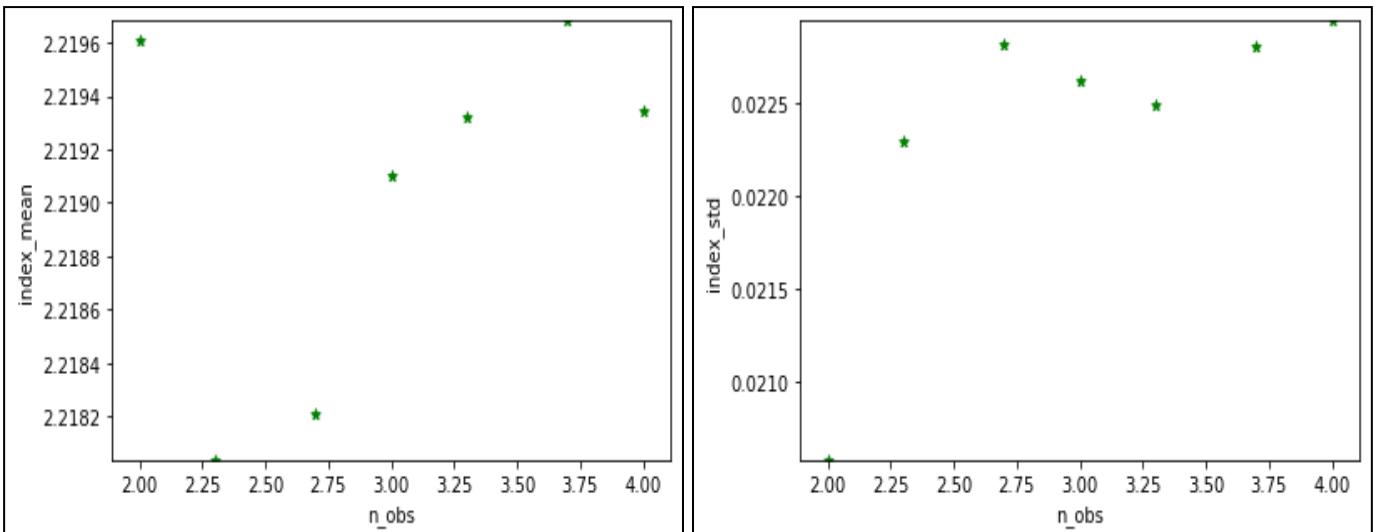


Exponentialcut-Powerlaw ($\Gamma = 0.5$):

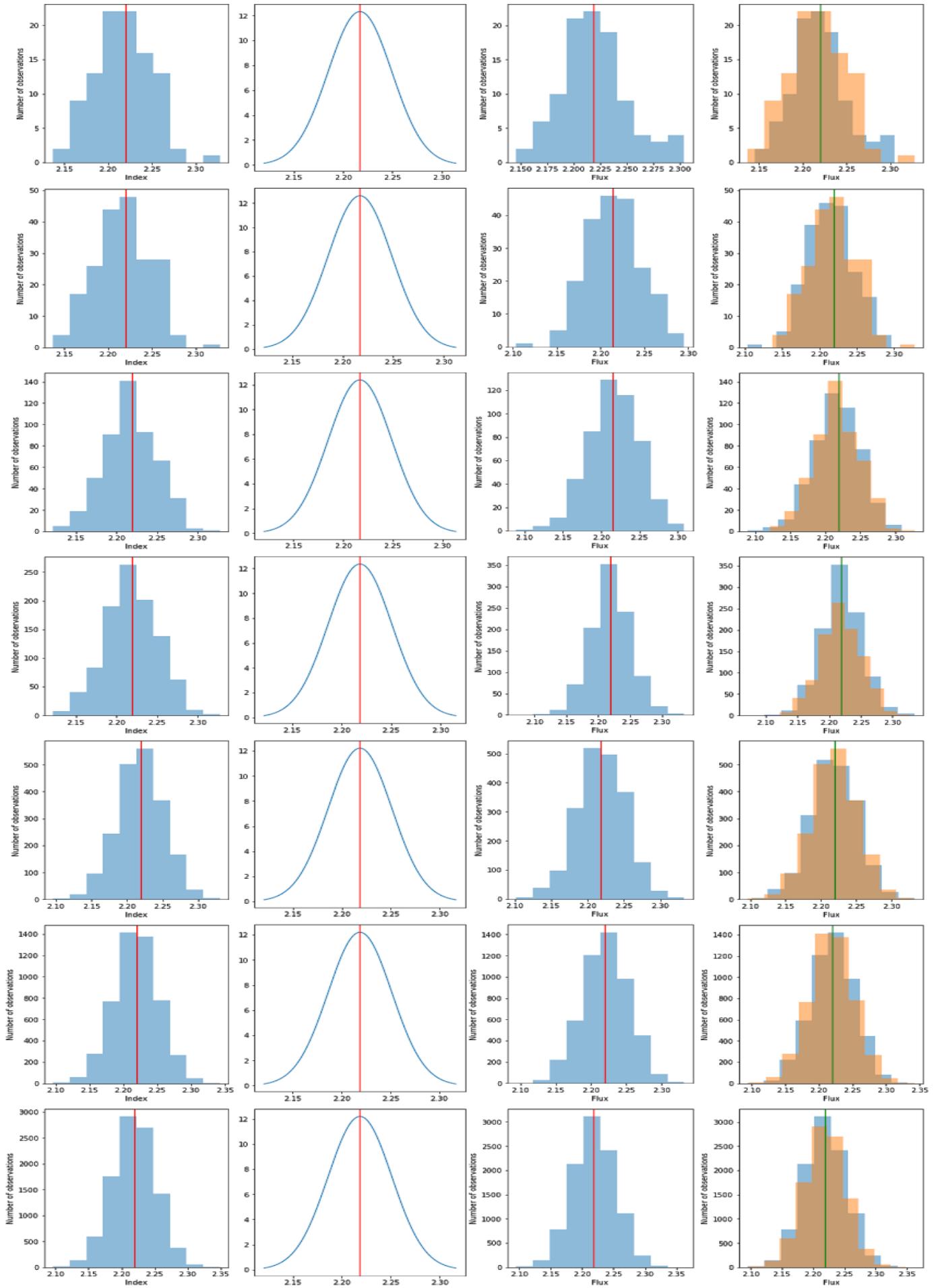


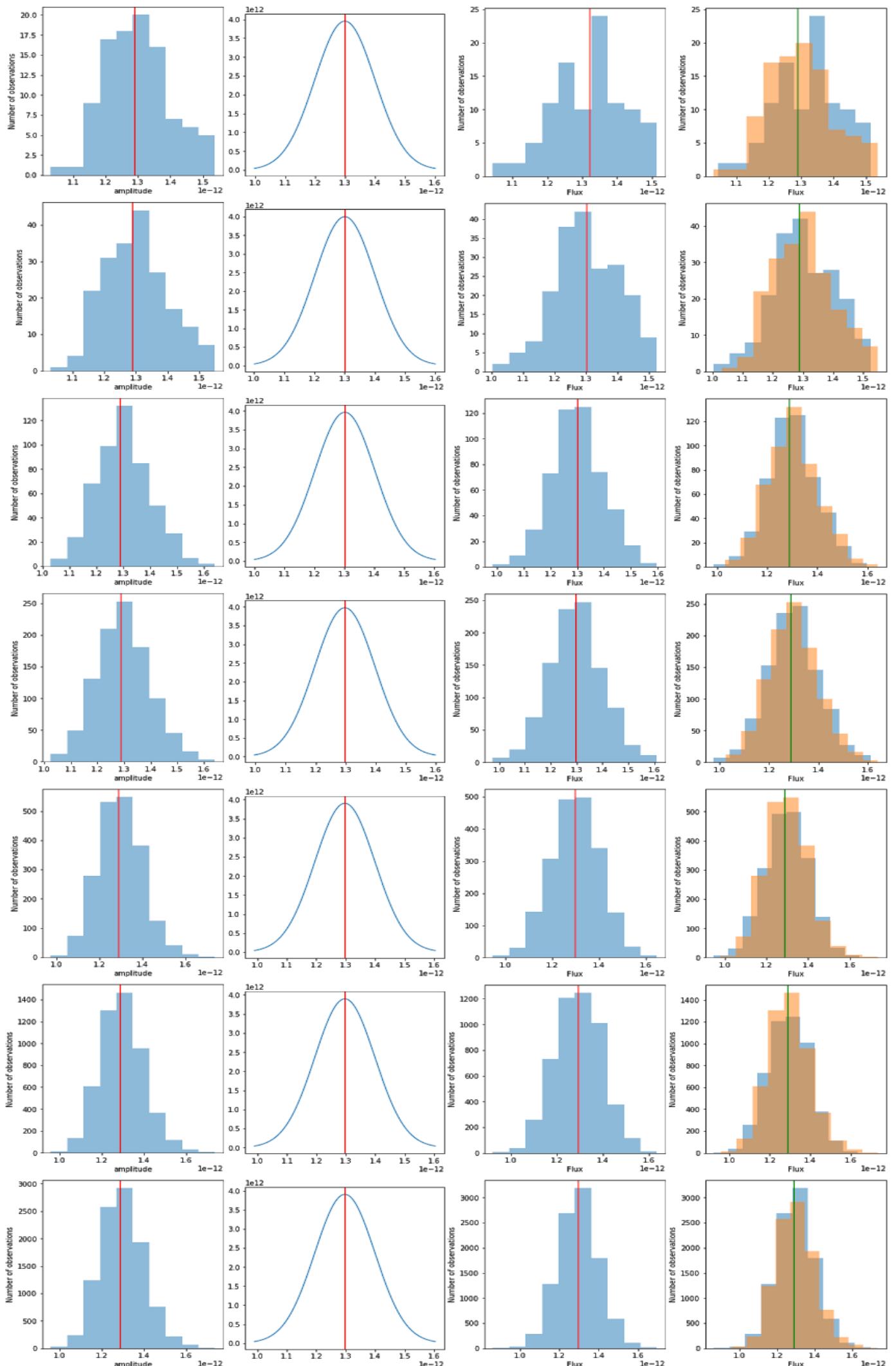


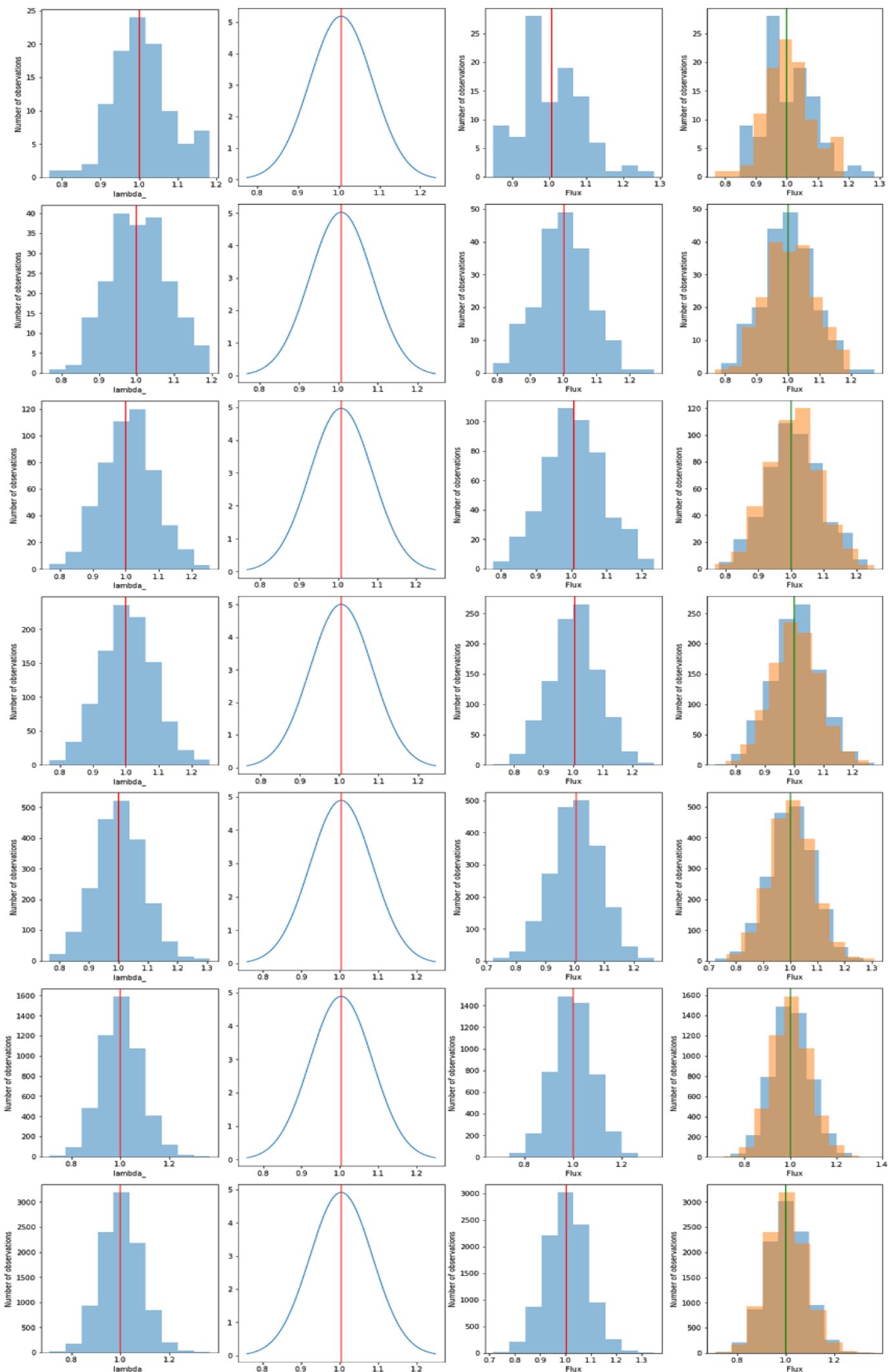


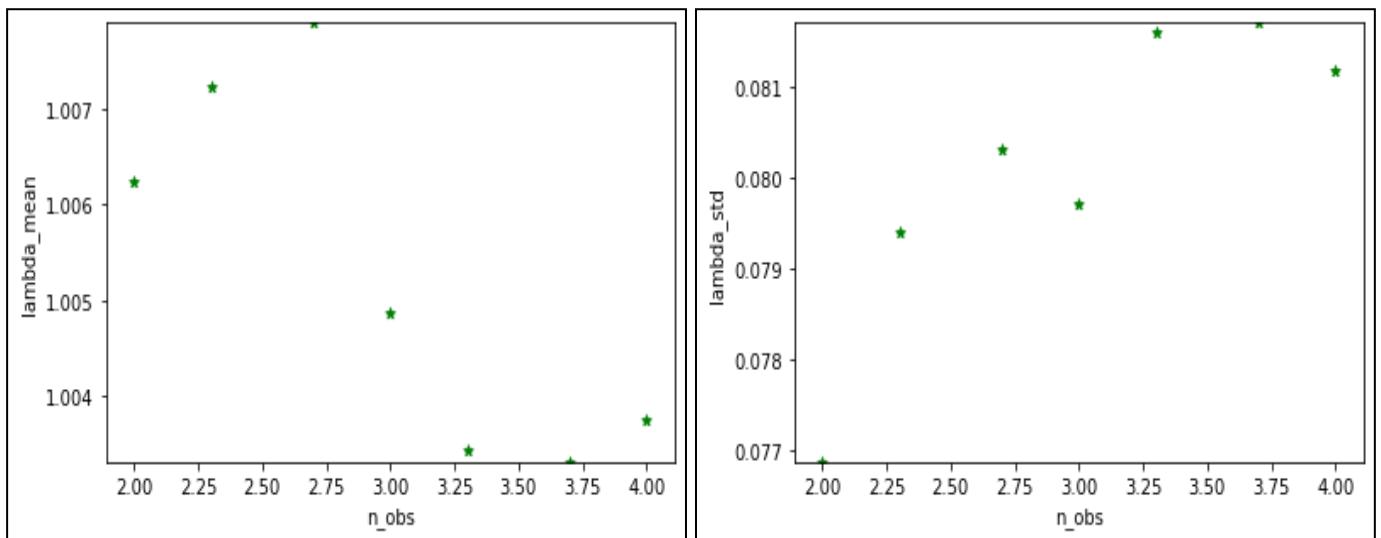
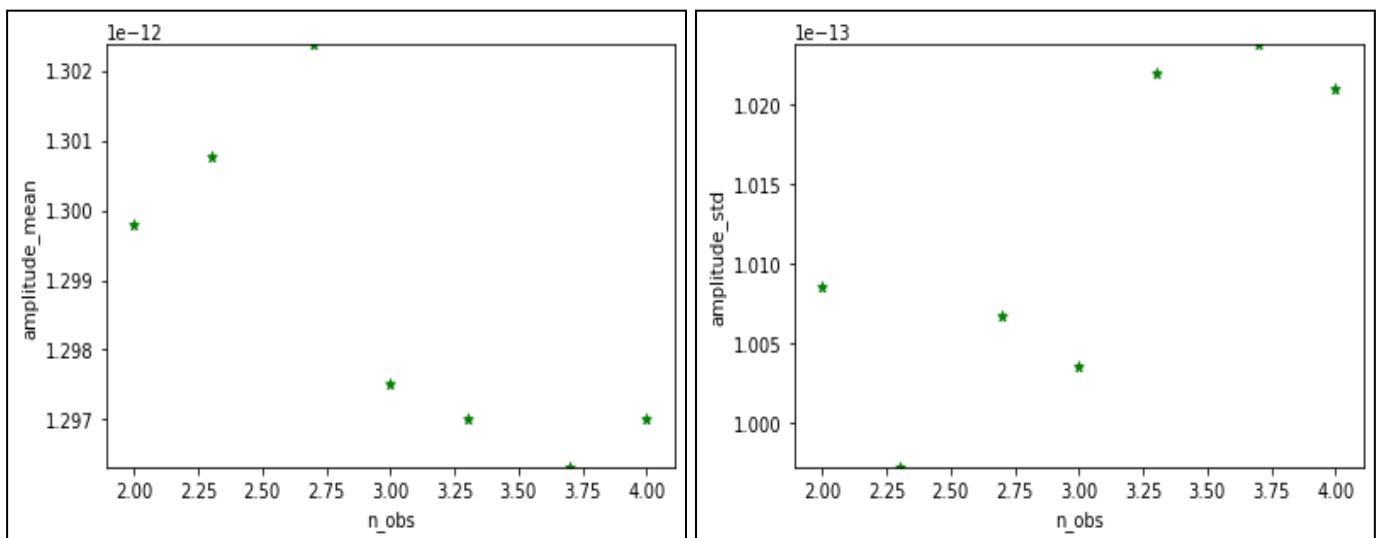
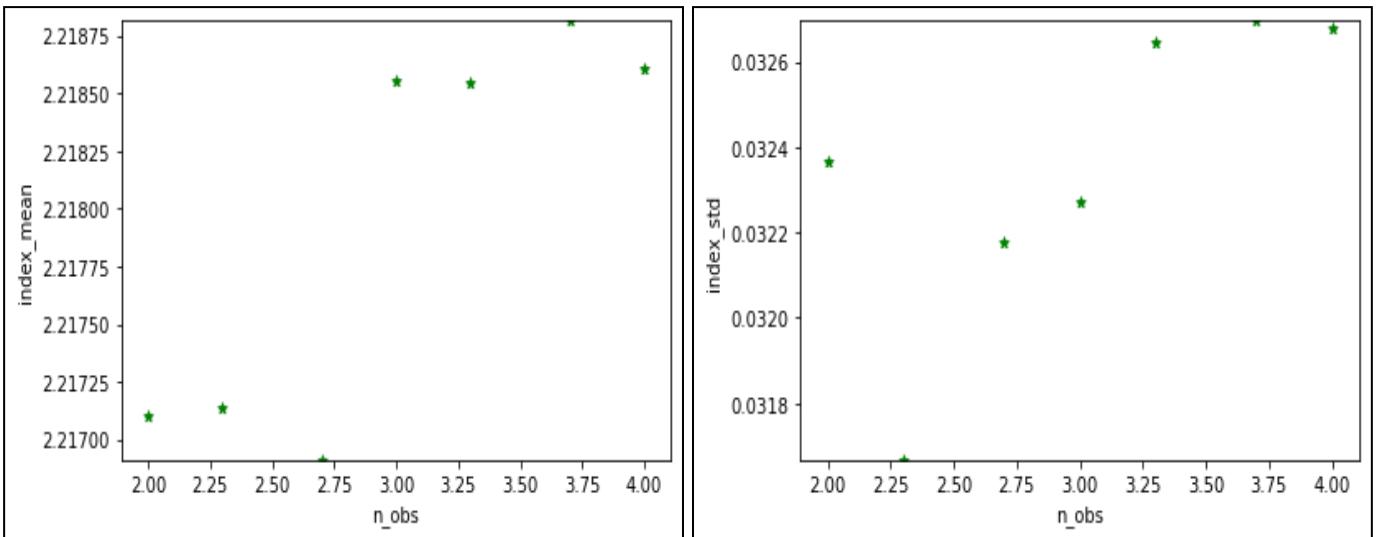


Exponentialcut-Powerlaw ($\Gamma = 1$):

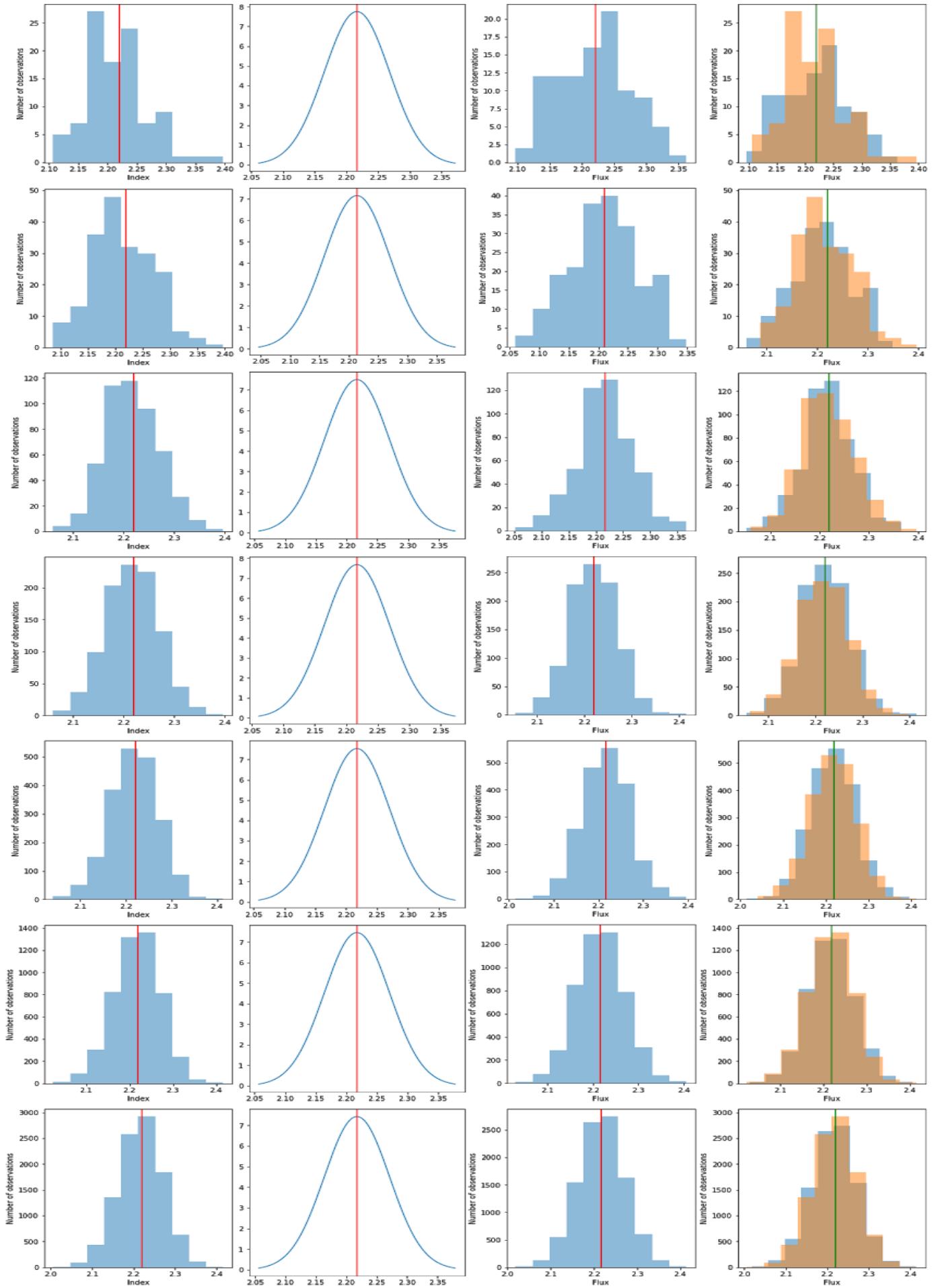


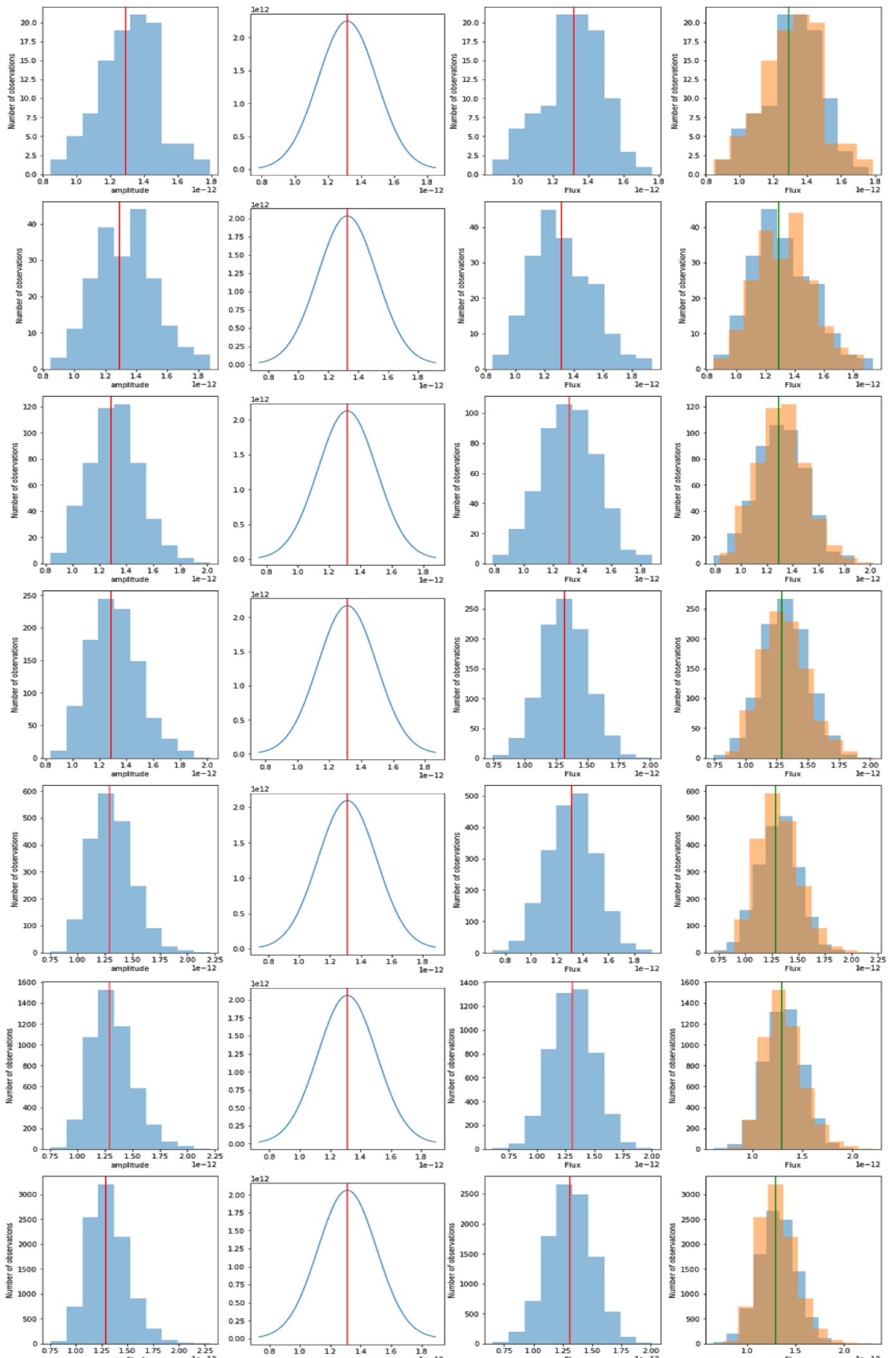


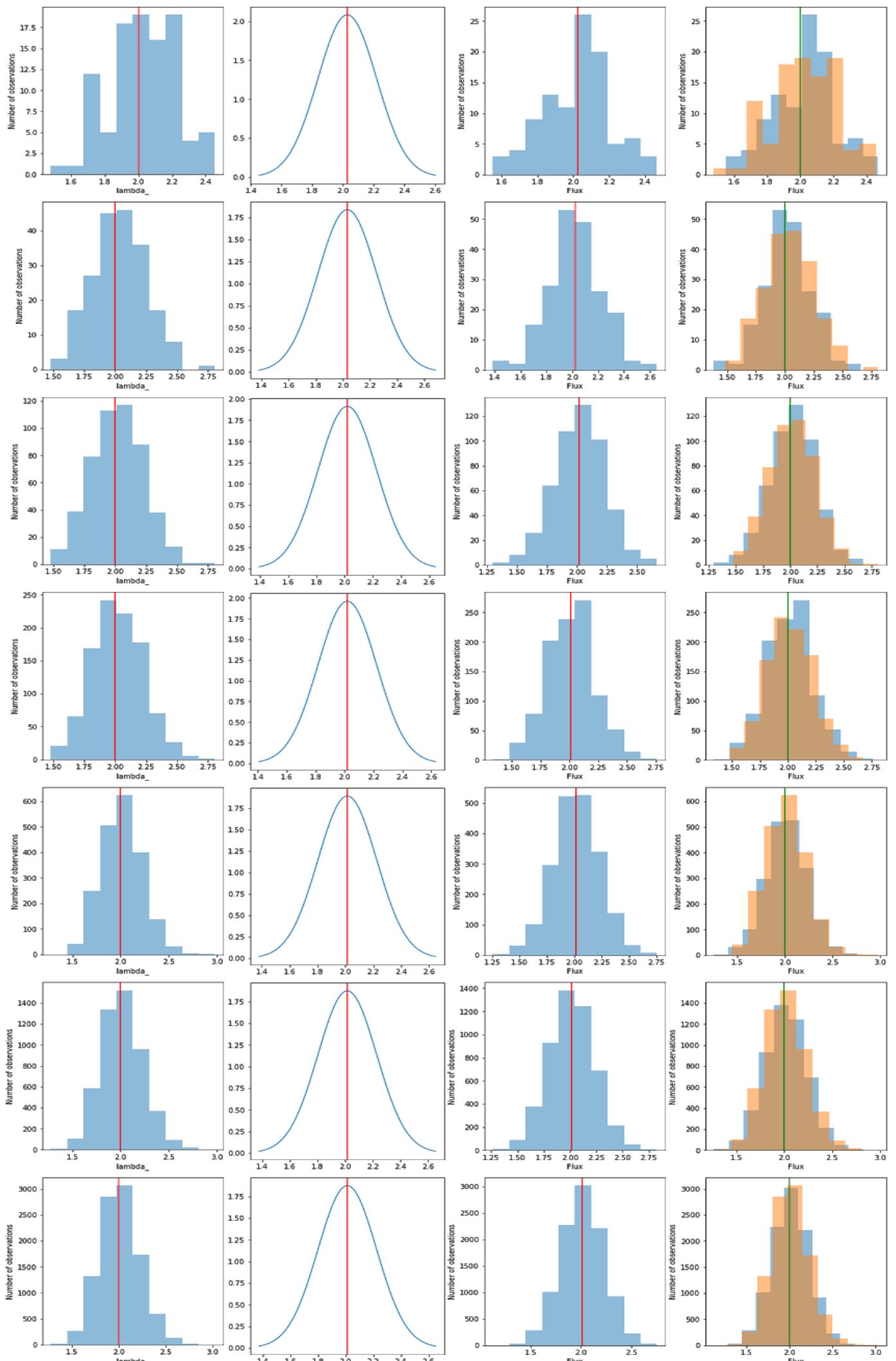


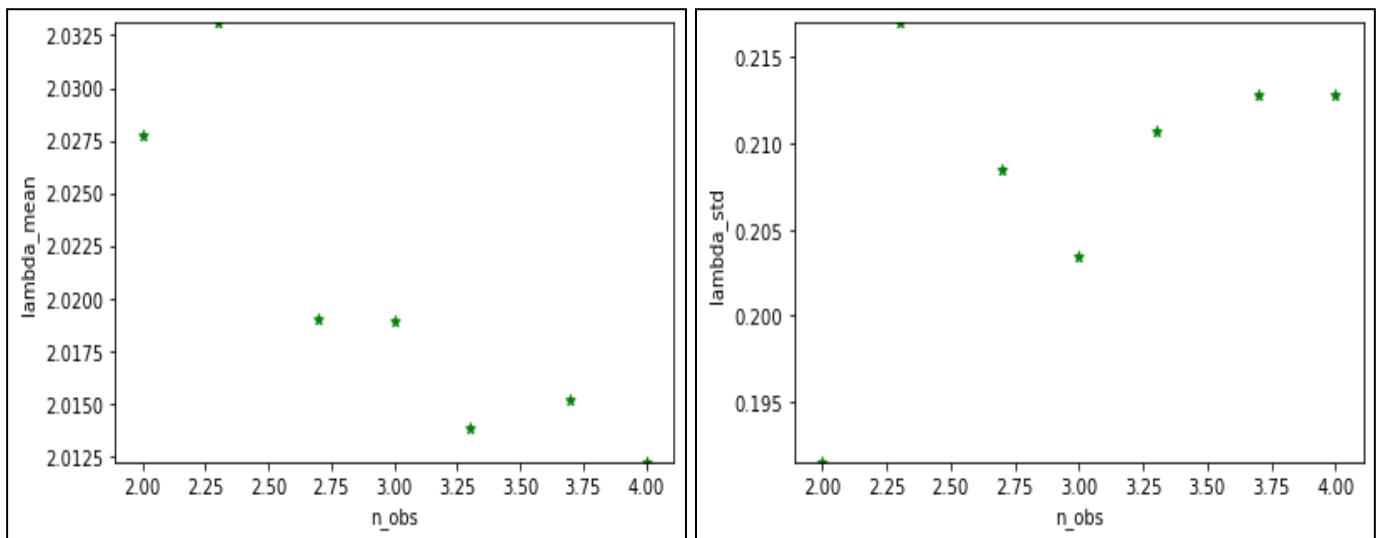
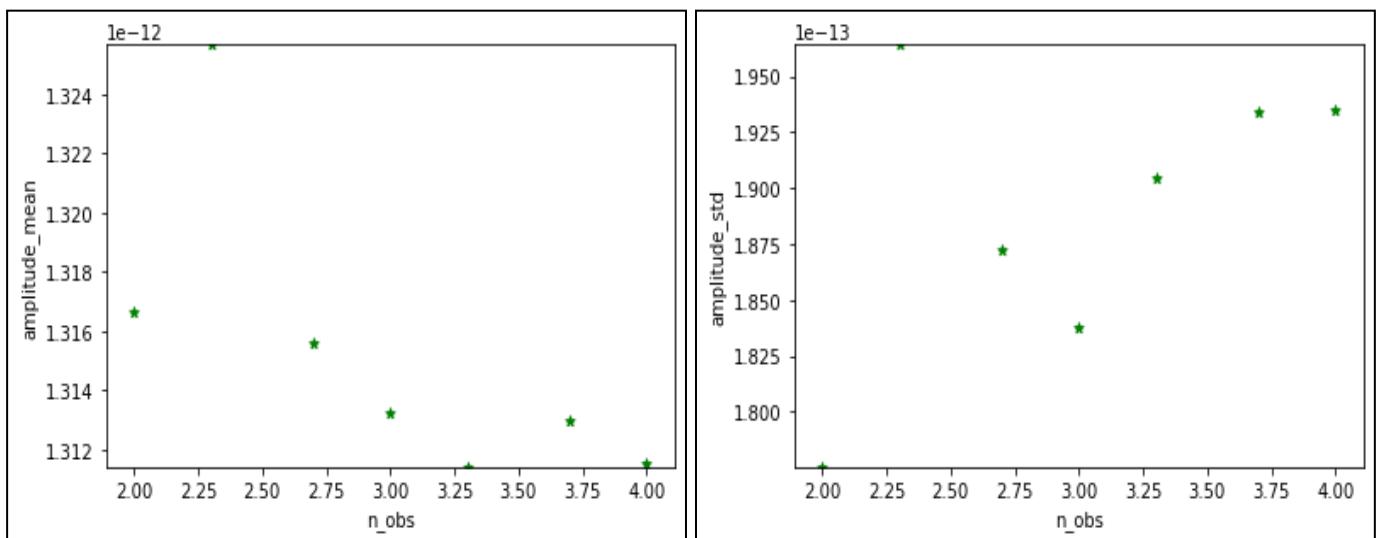
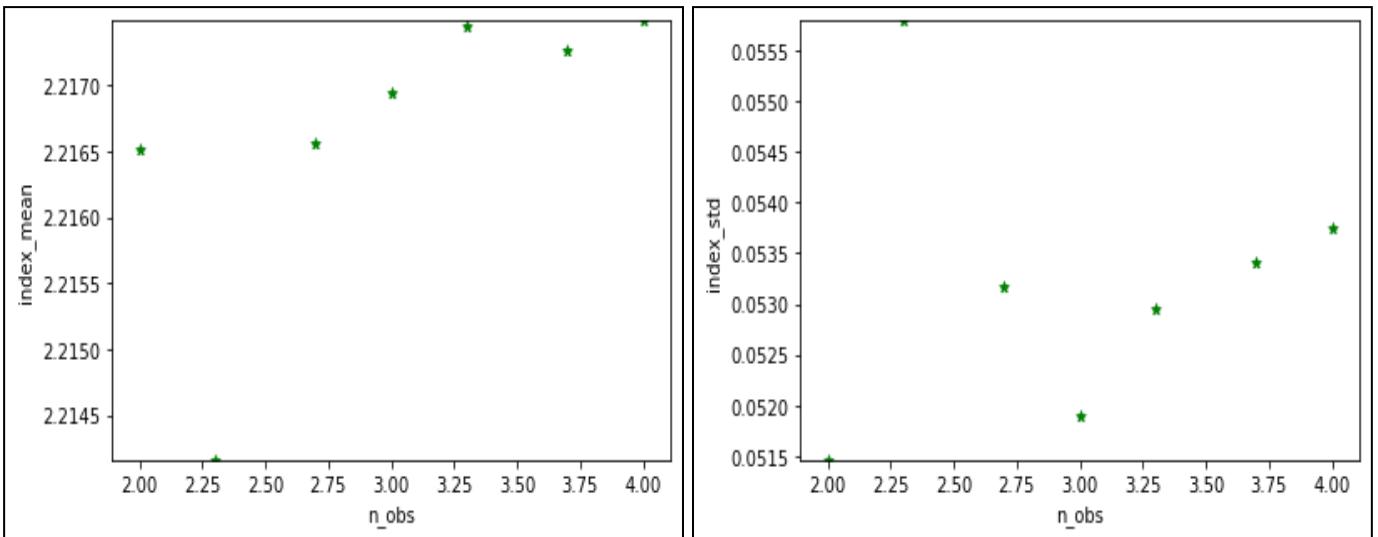


Exponentialcut-Powerlaw ($\Gamma = 2$):

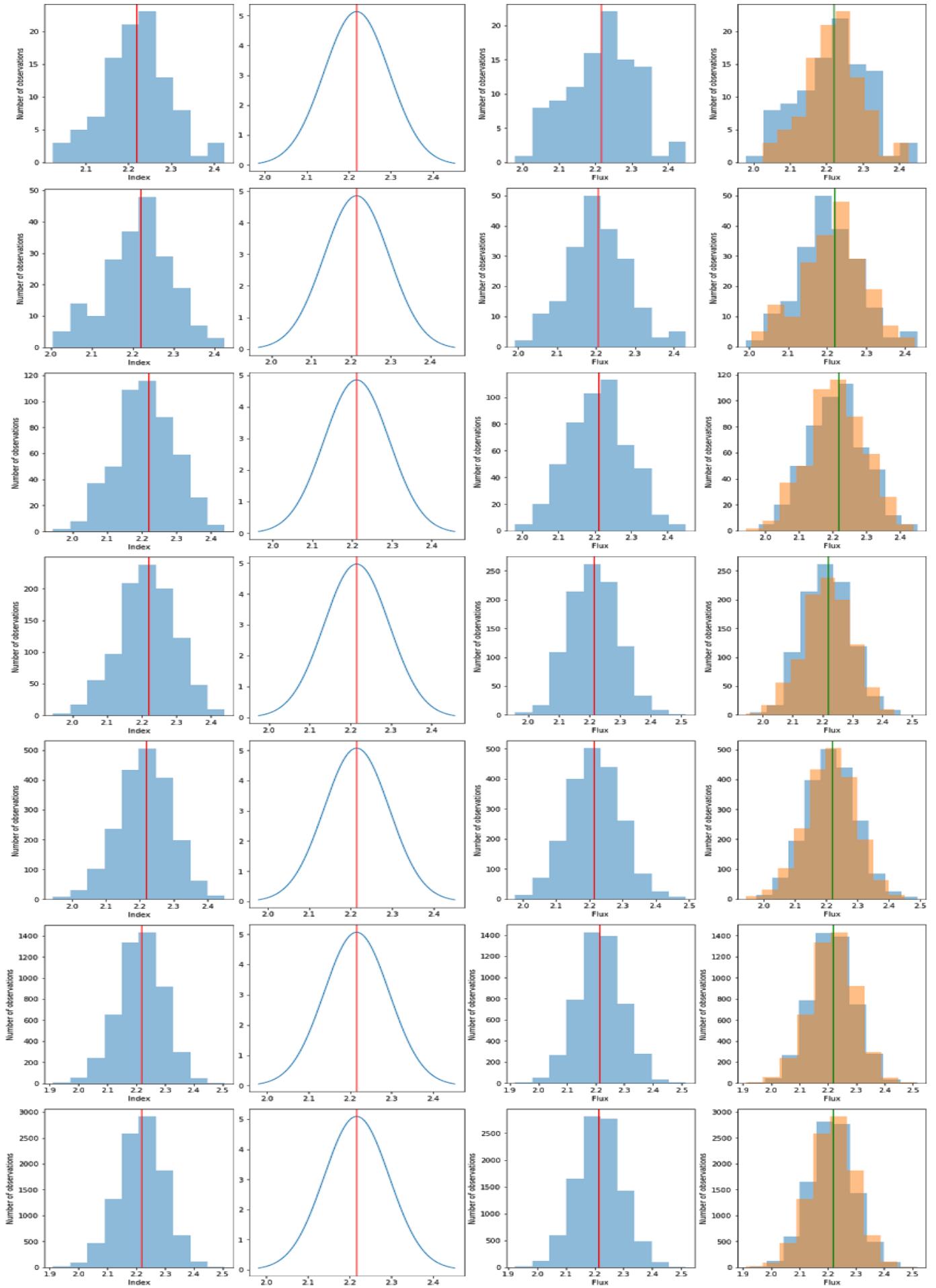


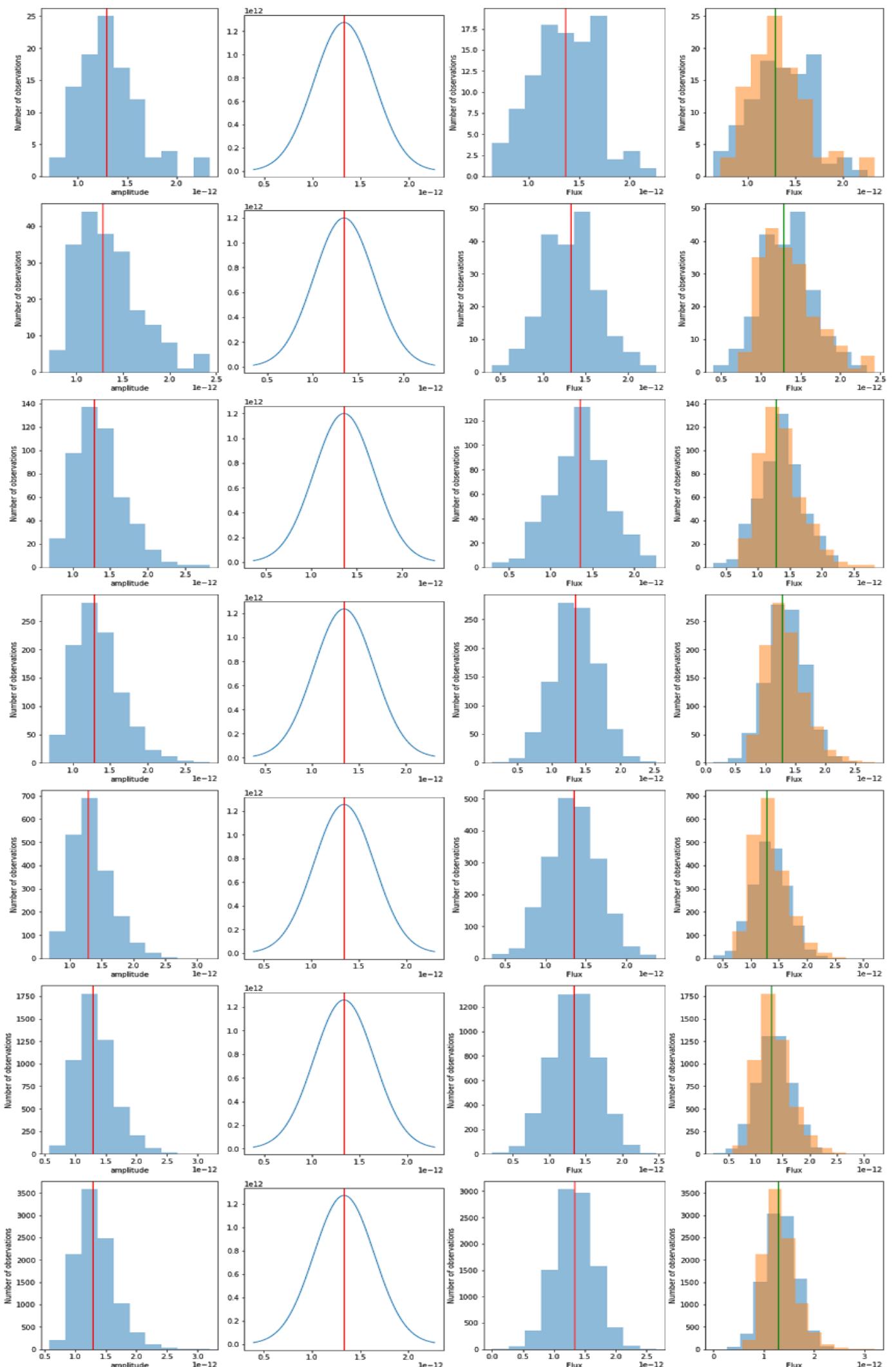


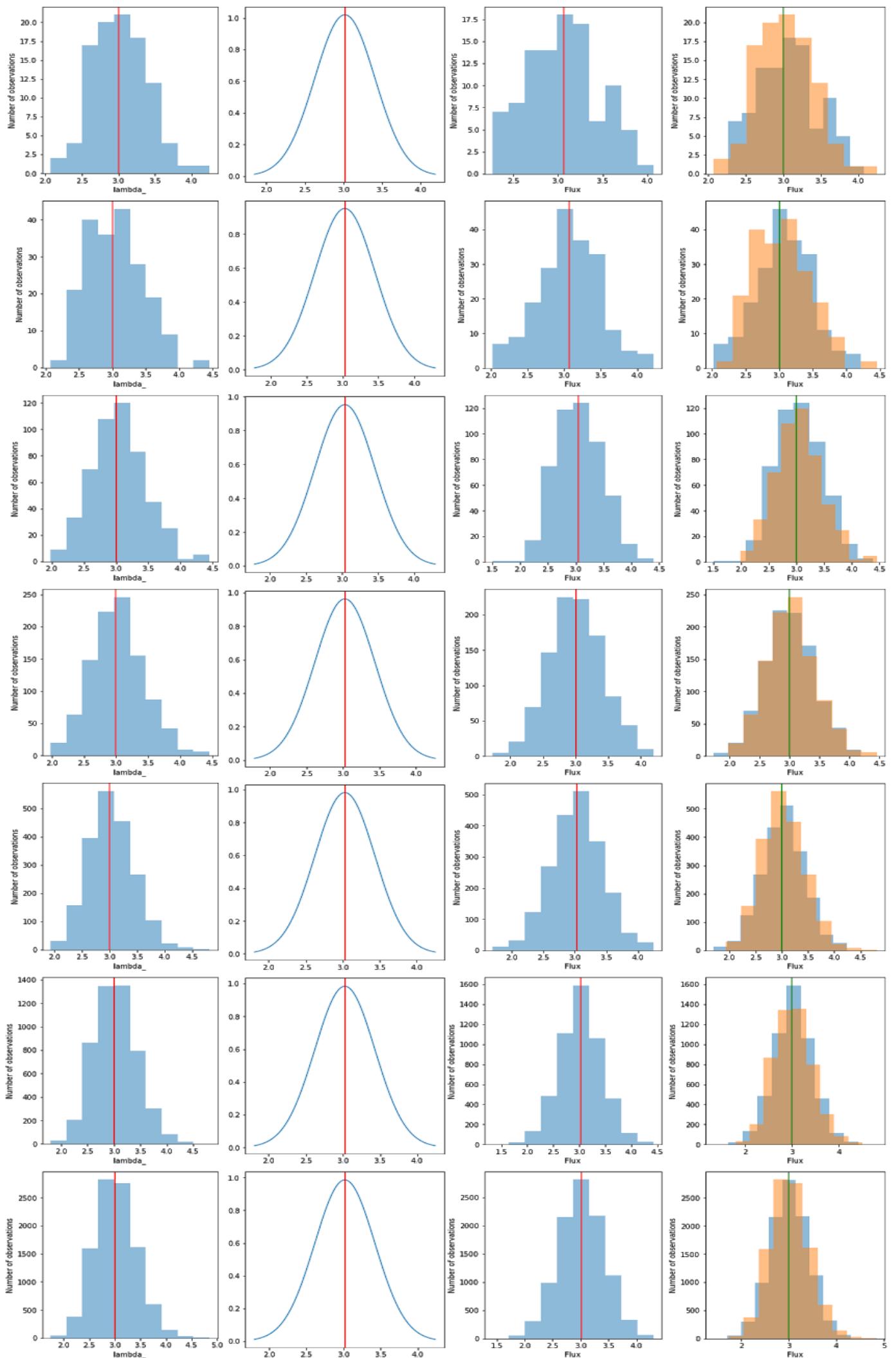


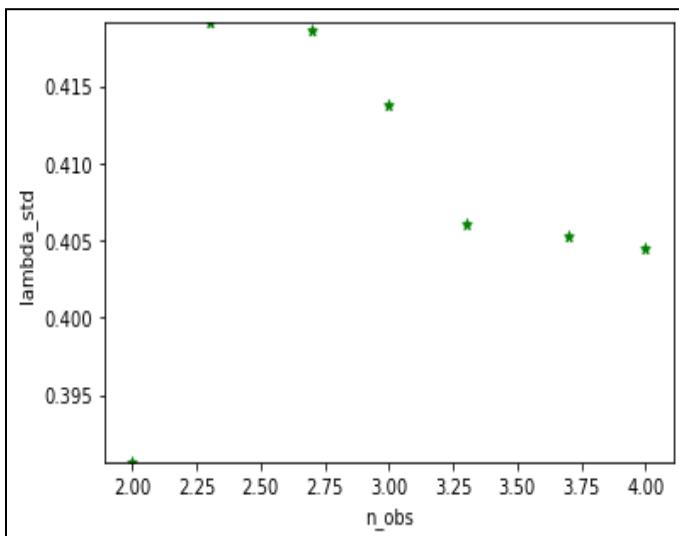
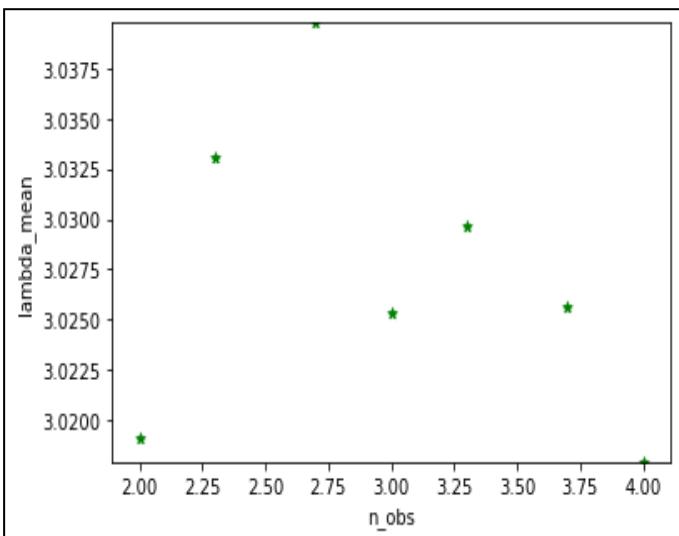
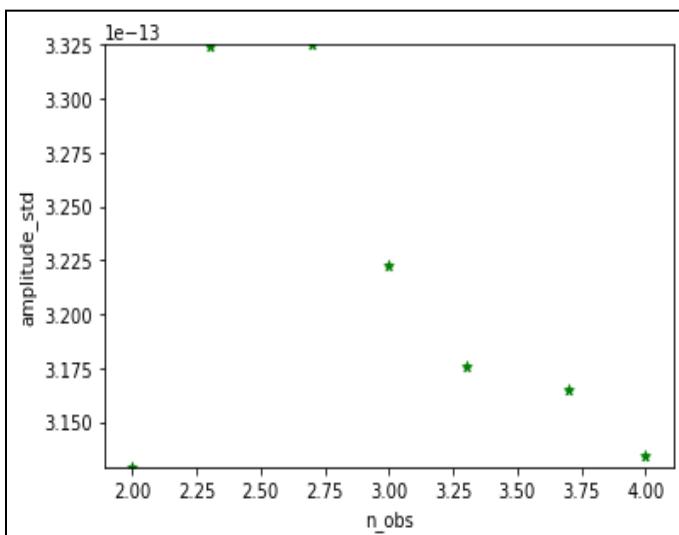
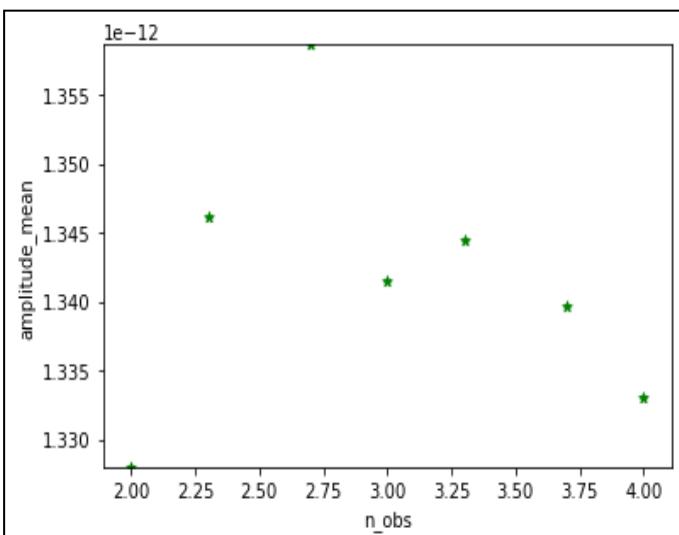
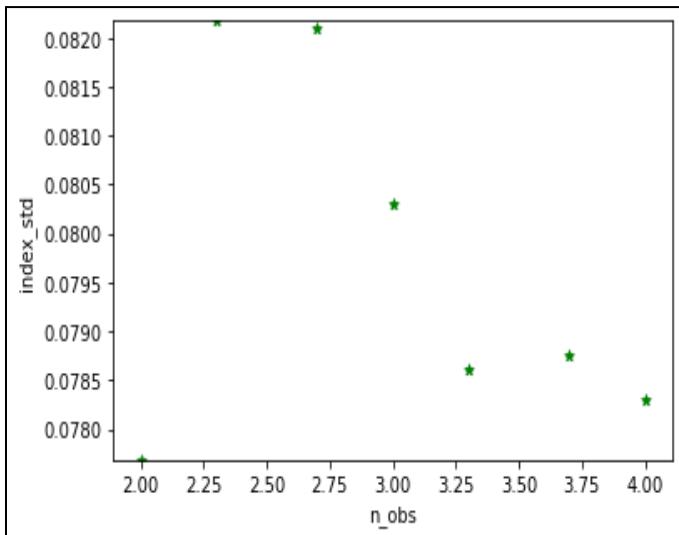
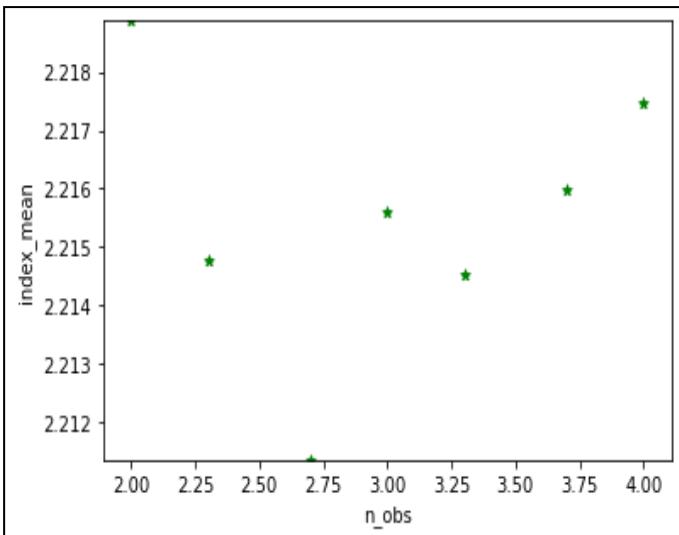


Exponentialcut-Powerlaw ($I = 3$):









Exponentialcut-Powerlaw ($\Gamma = 5$):

