MCMC computation of Bayesian evidence

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We compute the log evidence from the equation

$$\log Z = \int_0^1 \langle \log L \rangle_\beta \, d\beta \tag{1}$$

where $\langle \log L \rangle_\beta$ is the MCMC posterior chain obtained by using the probability p^β for constructing the chain in stead of p. We sample *beta* to construct the integral numerically (i=1...N)

$$\beta_i = \beta_{\min} \left(\frac{1}{\beta_{\min}} \right)^{\frac{i-1}{N-1}} \tag{2}$$

the weights, w_i, are simply determined from the trapezoidal integration rule to integrate β from 0 to 1.

The uncertainty of the sampled $\langle \log L \rangle_\beta$ is given by

$$\sigma^2_{\log Z} = \mathrm{Var}(\log Z) = \sum_{i=1}^{N} w_i^2 \frac{\mathrm{Var}_\beta(\log L)}{N_{\mathrm{post}}} \tag{3}$$