A single point source generates earthquakes of magnitude M=7 at a rate of NM_{min}=2 events per year. Use the Sadigh et al. 1997 GMM (strike-slip) to compute the seismic hazard curve for Sa(T=0.001) at a rock site located 100 km from the hypocenter. Truncate sigma at $\varepsilon_{max} = 2$ standard deviations.

Evaluating Sadigh et al 1997 at T=0.001s leads to

$$\ln Sa(0.001) = -1.274 + 1.1M - 2.1\ln(R + \exp(-0.485 + 0.5240M)) = -3.6988056763936$$

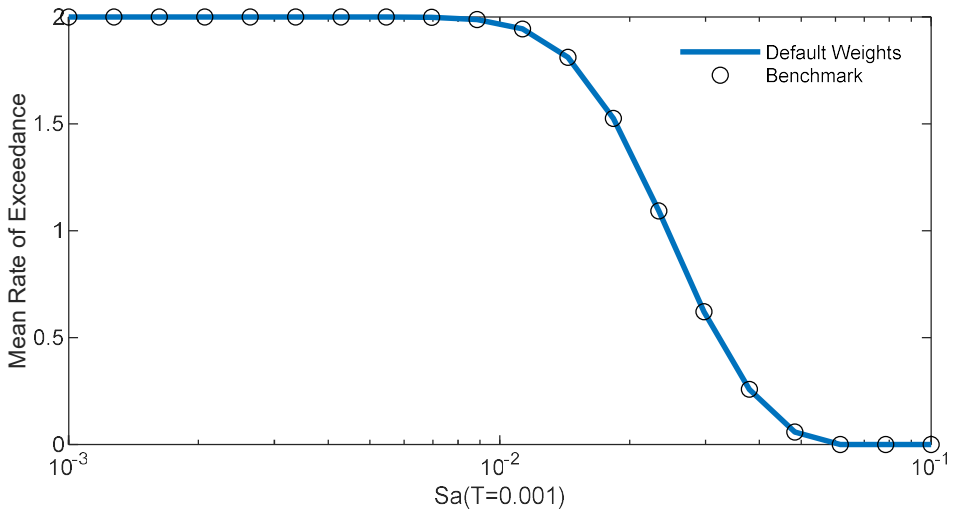
$$Sa(0.001) = \exp(-3.698) = 0.0248\ g$$

$$\sigma = 1.39 - 0.14M = 0.41$$

The hazard integral reduces to

$$\lambda_y = \frac{NM_{min}}{\Phi(\varepsilon_{max})} \begin{cases} 1 - \Phi\left(\dfrac{\ln Sa - \ln y}{\sigma}\right) & if\ \ln y \le \ln Sa + \varepsilon_{max}\sigma \\ 0 & otherwise \end{cases}$$

where Φ is the CDF for a standard normal distribution



Independent calculation in MATLAB:

```
NMmin  = 2;
mu     = -3.6988056763936;
sigma  = 0.41;
y      = logsp(0.001,0.1,20);
pd     = makedist('normal',0,1);
pd     = truncate(pd,-inf,2);
lambda = NMmin*(1-cdf(pd,(log(y)-mu)/sigma));
```