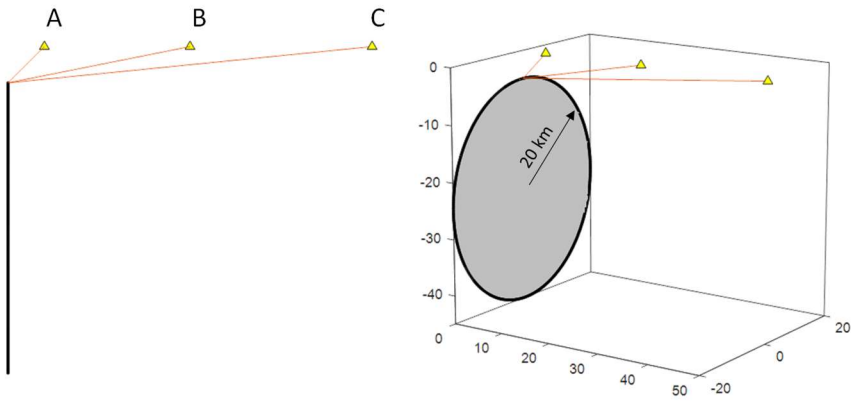
A single point source generates earthquakes of magnitude M=7.0992098 at a rate of NM_{min}=2 events per year. The focus is locate at XYZ(0,0,-25 km). Use the Abrahamson et al. 2016 (BCHydro) GMM (interface, forearc, $\Delta C_1 = -0.3$), , the rupture area relation by Wells and Coppersmith (i.e., $\log_{10}$A=M-7), and a circular rupture area to compute the hazard curve at sites A(5,0,0), B(25,0,0), and C(50,0,0).



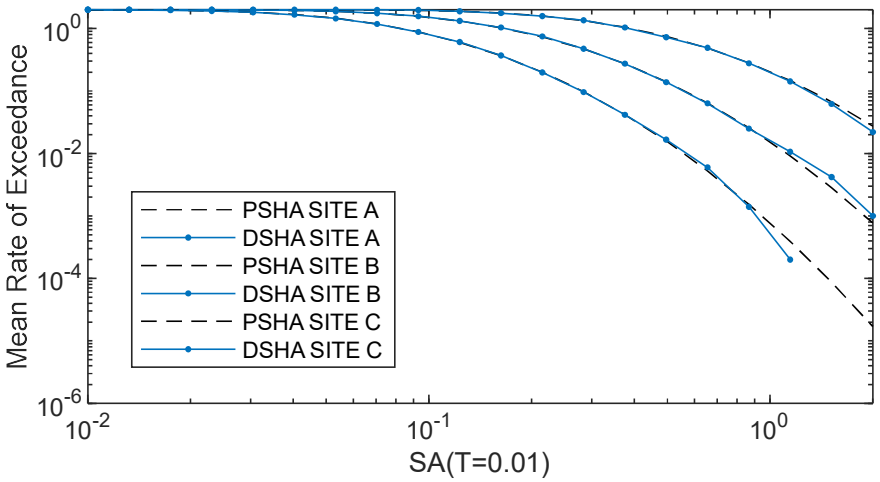
The rupture area is a circle of radius 20 km

$$\log_{10} A = \mathrm{M} - 4 = 3.099$$

$$A = 10^{3.099} = 1256.63\ km^2 = \pi(20km)^2$$

The ground motion parameters for the three sites

Site	Rrup	μ_{logSa}	ϕ	ϕ	σ
A	7.07	-0.93656	0.43	0.60	0.738
B	25.49	-1.7889	0.43	0.60	0.738
C	50.24	-2.4822	0.43	0.60	0.738



```
close all
t=0:1:360;
x=t*0;
y=20*cosd(t);
z=20*sind(t)-25;

close all,hold on,
patch('vertices',[x;y;z]','faces',1:361,'facecolor',[1 1
1]*0.75,'linewidth',2)
plot3([5 25 50],[0 0 0],[0 0 0],'k^','markerfacecolor','y');axis equal
axis equal
view([0 0])
axis off

plot3([0 5],[0 0],[-5 0],'color',[0.85 0.325 0.098])
plot3([0 25],[0 0],[-5 0],'color',[0.85 0.325 0.098])
plot3([0 50],[0 0],[-5 0],'color',[0.85 0.325 0.098])


r0 = [0 0 -5];
[lny,sigma,tau,phi] = deal(zeros(3,1));
M=4+log10(pi*20^2);
usp={[],25,760,'interface','forearc','central'};
r1 = [5 0 0];  Rrup1=norm(r0-r1);
r2 = [25 0 0]; Rrup2=norm(r0-r2);
r3 = [50 0 0]; Rrup3=norm(r0-r3);
[lny(1),sigma(1),tau(1),phi(1)]=BCHydro2012(0,M,Rrup1,usp{:});
[lny(2),sigma(2),tau(2),phi(2)]=BCHydro2012(0,M,Rrup2,usp{:});
[lny(3),sigma(3),tau(3),phi(3)]=BCHydro2012(0,M,Rrup3,usp{:});

im=logsp(0.01,2,20);
lambdaA = 2*(1-normcdf((log(im)-lny(1))/sigma(1)));
lambdaB = 2*(1-normcdf((log(im)-lny(2))/sigma(2)));
lambdaC = 2*(1-normcdf((log(im)-lny(3))/sigma(3)));
loglog(im,[lambdaA;lambdaB;lambdaC])
```