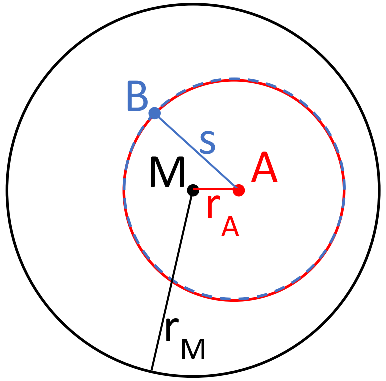
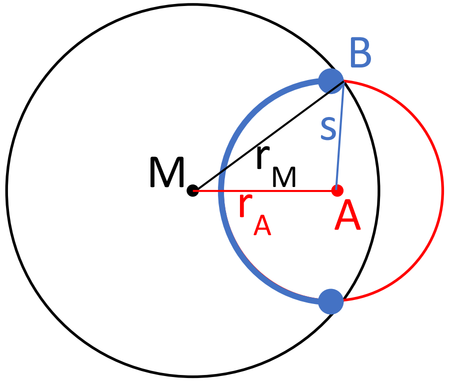
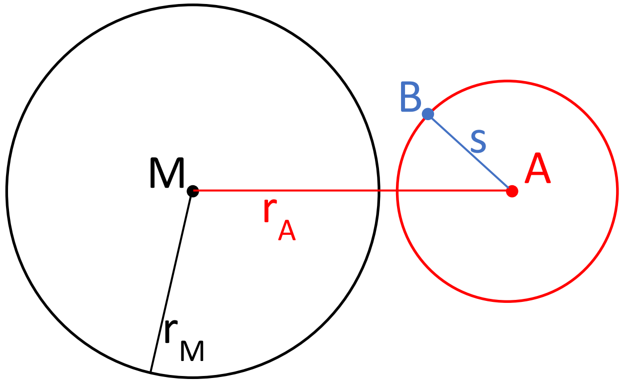


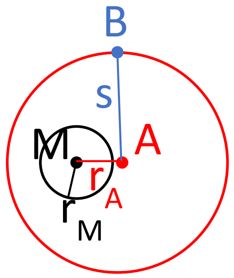
P(B|A,r_M,s,r_A<r_M-s)=1



P(B|A,r_M,s,r_M-s<r_A<r_M+s)=?



P(B|A,r_M,s,r_A>r_M+s)=0



P(B|A,r_M,s,r_A+2r_M<s)=0

$$p(B|A,r_M,s,r_A) = \frac{1}{2\pi s r_A}\sqrt{4r_A^2 r_M^2 - (r_A^2 - s^2 + r_M^2)^2}$$

General result when there is intersection. Adapted from equation (8) from http://mathworld.wolfram.com/Circle-CircleIntersection.html

General purpose no-intersection condition based on what's under the square root

$$p(B|A,r_M,s,4r_A^2 r_M^2 - (r_A^2 - s^2 + r_M^2)^2) = 0$$

$$p(B|A,r_M,s) = \frac{1}{\pi r_M^2} 2\pi \int_0^{r_M} p(B|r_M,s,r_A) r_A dr_A = \frac{\max(0,r_M - s)^2}{r_M^2} + \frac{1}{\pi s r_M^2}\int_{\max(0,r_M-s)}^{r_M} \sqrt{\max(0,4r_A^2 r_M^2 - (r_A^2 - s^2 + r_M^2)^2)}\, dr_A$$

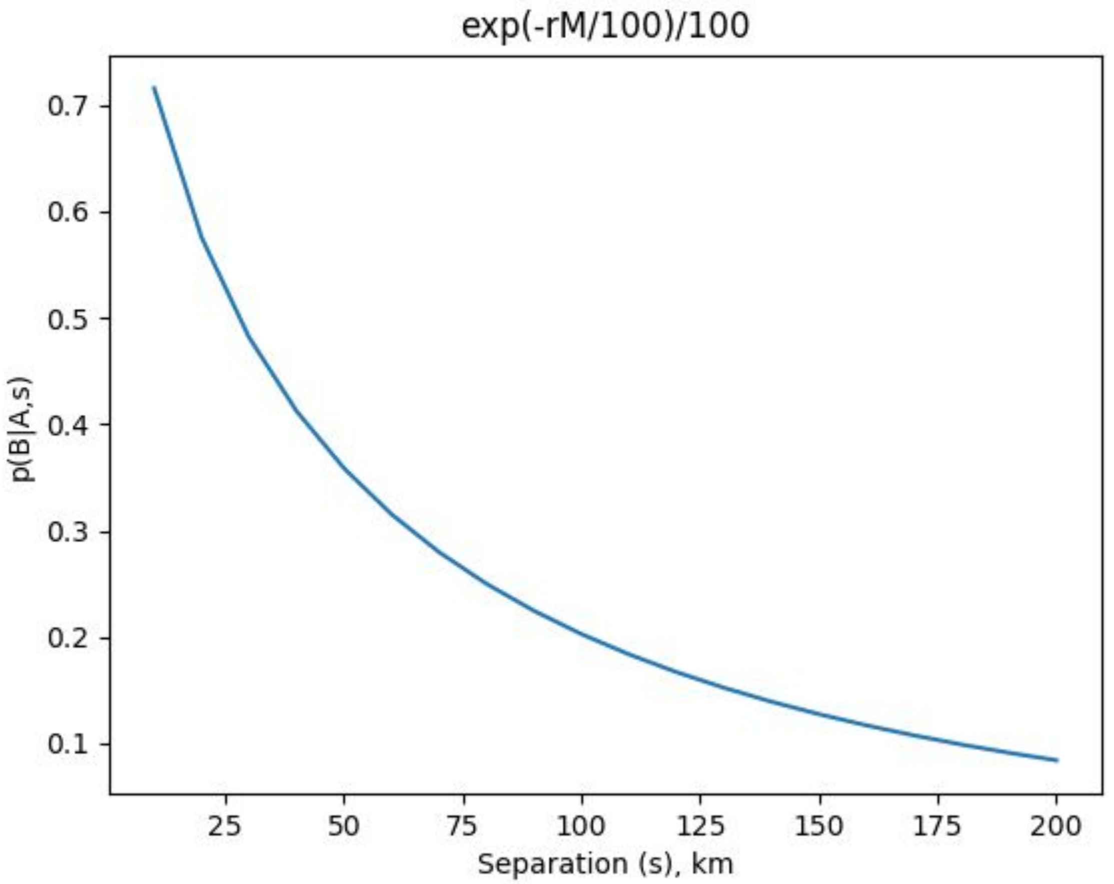
All possible AC6-B locations inside microburst

Some AC6-B locations inside microburst.

$$p(B|A,s) = \int_0^{\infty} p(r_M) p(B|r_M,s) dr_M$$

Probability of observing microburst at B, given that it is observed at A and the A-B separation is s

r_M – radius of microburst
r_A – distance from microburst center to AC6-A
s – separation between AC6-A and –B


exp(-rM/100)/100
p(B|A,s)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
25
50
75
100
125
150
175
200
Separation (s), km