$$A = [-\pi, \pi] \times [-1, 1]$$

$$(x,y) \mapsto (r,x,\sin(y)).$$

$$(r, \theta, \varphi)$$

$$\mathbb{P}[\text{Message received}] = 1 - \left(1 - e^{-\frac{\pi^2/2}{\sqrt{P/N}}}\right)^N,$$