$$p(y|\theta) = e^{-\theta^2 n} \prod_{i=1}^{n} \theta^{2y_i} / const \quad , \quad \log p(y|\theta) = -\theta^2 n + \sum_{i=1}^{n} 2y_i \log\theta + const$$

$$\frac{\partial}{\partial\theta} = -2\theta n + \frac{2}{\theta}\sum_{i=1}^{n} y_i \quad , \quad \frac{\partial}{\partial\theta^2} = -2n - \frac{2}{\theta^2}\sum_{i=1}^{n} y_i$$

$$\hat{\theta}_{ML} = \sqrt{\frac{1}{n}\sum_{i=1}^{n} y_i} \quad , \quad \hat{I}(\theta) = +4n$$

$$P\left(z_{\alpha/2} < \frac{\hat{\theta}_{ML} - \theta}{\sqrt{1/(4n)}} < z_{1-\alpha/2}\right) = P\left(\hat{\theta}_{ML} - \frac{1}{2\sqrt{n}} z_{1-\alpha/2} < \theta < \hat{\theta}_{ML} - \frac{1}{2\sqrt{n}} z_{\alpha/2}\right) = 1-\alpha$$

$$CI(\lambda) = \left(\max(0, \hat{\theta}_{ML} - \frac{1}{2\sqrt{n}} z_{1-\alpha/2})^2 < \lambda < (\hat{\theta}_{ML} - \frac{1}{2\sqrt{n}} z_{\alpha/2})^2\right)$$