We'll use the ML model to predict λ

$$\lambda = f(x_i, \phi) \qquad \text{but} \quad \lambda \geq 0 \quad, \text{ so we use } \lambda = [f(x_i, \phi)]^2$$

$$L(\phi) = -\sum_{i=1}^{I} \log \left[Pr\left(y_i \mid f(x_i, \phi) \right) \right]$$

$$= -\sum_{i=1}^{I} \log \left[\frac{(f(x_i, \phi))^{2y_i} \exp\left(-f(x_i, \phi)^2\right)}{y_i!} \right]$$

$$= -\sum_{i=1}^{I} \left[2y_i \log f(x_i, \phi) - (f(x_i, \phi))^2 - \log y_i! \right]$$