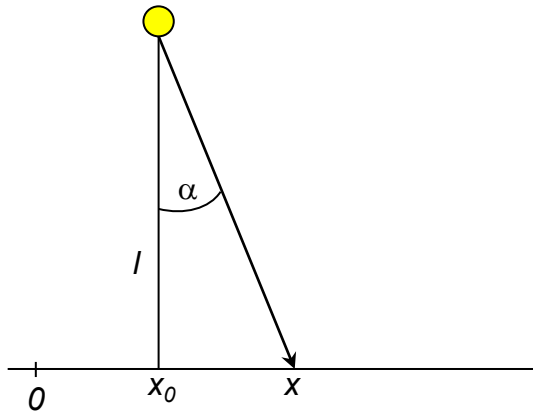


Problém majáku



$$x - x_0 = l \operatorname{tg}(\alpha)$$

$$\alpha = \operatorname{arctg}\left(\frac{x - x_0}{l}\right) \quad \alpha \in U\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$$

$$g(x) = \frac{1}{\pi} \left| \frac{d\alpha}{dx} \right| = \frac{1}{\pi} \frac{l}{l^2 + (x - x_0)^2}$$

- chceme najít odhad x_0 a

- věrohodnostní funkce:
$$L(x_0, l | \{x\}) = \prod_{i=1}^N \frac{1}{\pi} \frac{l}{l^2 + (x_i - x_0)^2}$$

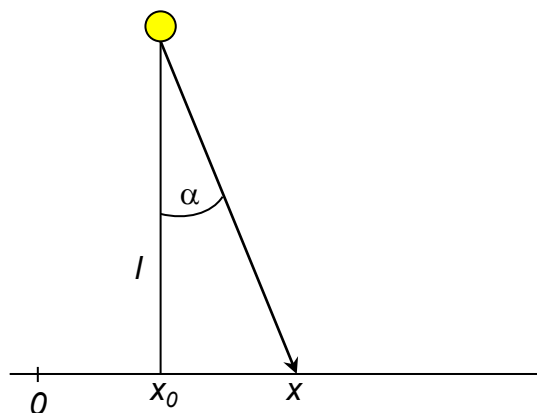
$$\ln L = \sum_{i=1}^N \ln(l) - \sum_{i=1}^N \ln [\pi(l^2 + (x_i - x_0)^2)]$$

$$\frac{\partial \ln L}{\partial l} = 0$$

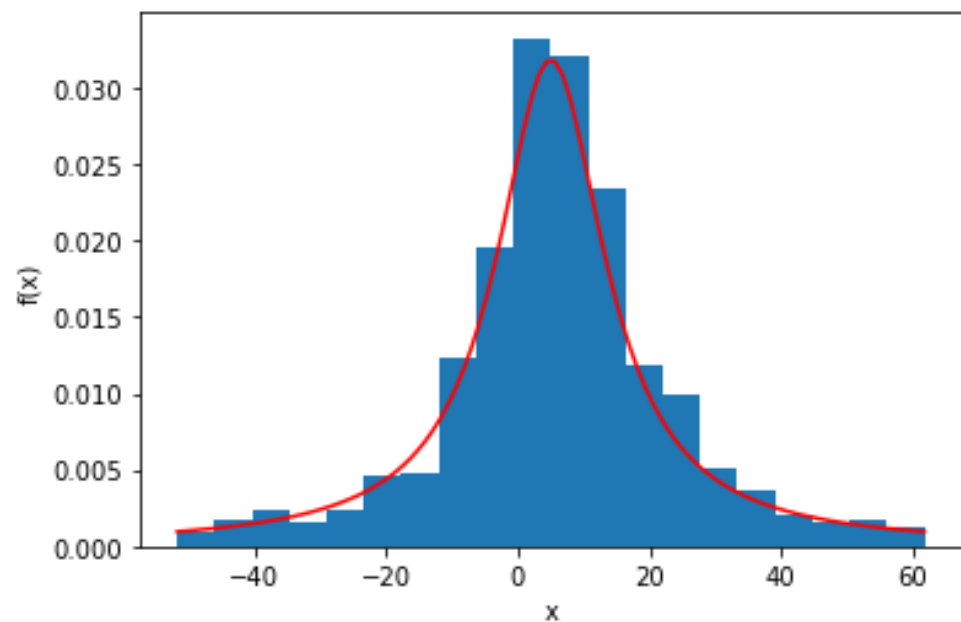
$$\frac{\partial \ln L}{\partial x_0} = 0$$



soustava dvou
nelineárních rovnic



simulace naměřených dat $x_0 = 5, l = 10$



věrohodnostní funkce

$$\hat{x}_0 = 4.7 \quad \hat{l} = 10.4$$

