Substitute $h(\mathbf{x},t) = e^{-S(\mathbf{x},t)}$

Governing equation: $\nabla \cdot (\mathbf{K} \cdot \nabla h) = \zeta$

Solve

numerically

Sensitivity

Perturbation method

$$\frac{d\mathbf{x}}{dt} = \frac{1}{7}\mathbf{p}$$

$$\frac{d\mathbf{x}}{dt} = \frac{1}{\zeta}\mathbf{r}$$

$$\frac{d\mathbf{x}}{dt} = \frac{1}{\zeta} \mathbf{p}$$

$$\frac{d\mathbf{p}}{dt} = \nabla \begin{bmatrix} \mathbf{p} & \mathbf{p} \\ \mathbf{q} & \mathbf{p} \end{bmatrix}$$

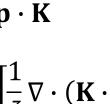
Ray equations:
$$\frac{d\mathbf{x}}{dt} = \frac{1}{\zeta}$$

$$\frac{d\mathbf{x}}{dt} = \frac{1}{\zeta} \mathbf{p} \cdot \mathbf{K}$$

$$\frac{d\mathbf{p}}{dt} = \nabla \left[\frac{1}{\zeta} \nabla \cdot (\mathbf{K} \cdot \mathbf{p}) \right]$$

Use

simulator



 $T = \int_{\Gamma} \frac{1}{v} dx = \int_{\Gamma} s dx$

 $\delta T = \int \delta s(x) dx$

