

**Vanessa Styles**

*Numerical analysis of an inverse problem for the eikonal equation*

We are concerned with the inverse problem for an eikonal equation of determining the speed function using observations of the arrival time on a fixed surface. This is formulated as an optimisation problem for a quadratic functional with the state equation being the eikonal equation. The existence of an optimal speed function is proved. We prove convergence of a numerical solution problem and describe some numerical results.