ID: Type: **Poster**

Infrasound Source Location Using the Neighbourhood Algorithm in an Inhomogeneous Atmosphere with Winds

The Neighbourhood Algorithm is a grid-based search method that optimizes a user-supplied objective function over a computational domain using Voronoi cell tesselation. The algorithm is a method for solving geophysical inverse problems that has the additional benefit of not requiring the estimation of travel-time derivative information. In this application a misfit function for infrasound detections, which is defined in terms of observed and predicted values of travel time and backazimuth and their uncertainties, is minimised using the neighbourhood algorithm. Realistic atmospheric specifications are used to refine the forward modelling stage. Tests are performed using the events from the Infrasound Reference Event Data Base (IRED).

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Track Classification: Theme 3: Advances in Sensors, Networks and Processing