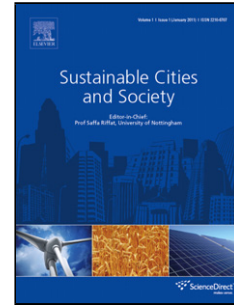# Accepted Manuscript

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Deep learning for solving inversion problem of atmospheric refractivity estimation

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Highlights:

- In this study, based on the refractivity profile of the evaporation duct and the surface based duct, we propose a new inversion method, using deep learning (DL) to address the inversion problem of atmospheric refractivity. we established a network mapping model between the sea clutter and the refractivity profile parameters.
- Analyzing the factors affecting the accuracy of the DL network model, including training data quantity, the number of iterations and number of hidden layers.
- Given the estimated results from three different methods: DL, NN, and GA.
- Compared with other methods, using DL to solve the inversion problem of atmospheric refractivity estimation within a certain noise range can reduce computational time significantly, and yield effective accuracy.

Abstract:

Atmospheric ducts are typical occurrences in marine environments. They can trap electromagnetic waves in