

## Deep learning for atmospheric duct estimation from radar sea clutter

\*Xiaofeng Zhao<sup>1</sup>, Huadong Du<sup>1</sup>, Zhixian Luo<sup>1</sup>

1. College of Meteorology and Oceanography, National University of Defense Technology

Atmospheric duct is a kind of non-standard refractive structure. It can change the electromagnetic wave (EM) propagation paths and capture the EM rays in the duct layer to form the atmospheric duct propagation, leading to substantial influences on the performance of radar and wireless telecommunication systems. On the other hand, when the EM waves propagate in the duct layer, they carry the information of this layer. From the perspective of inverse problem, the structure of the duct layer can be retrieved from these EM signals. Nowadays, deep learning (DL) has been applied in many remote sensing areas. This paper proposes the feasibility of using the DL for the inverse problem of “refractivity from clutter (RFC)”. Through the simulation data, a DL network mapping model between the radar sea clutter and the duct parameters is constructed, and the factors that may affect the accuracy of the network model are discussed.

Keywords: atmospheric duct, radar sea clutter, deep learning