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Automated Detection of Low-altitude Isolated Mesospheric Radar Echoes Using YOLOv8:
Evidence for a C-Layer Phenomenon near 60 km Altitude?

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Answers to Reviewer #2

We appreciate the reviewer's careful reading and the valuable comments provided. Please find below our answers to the remaining points.

Major comments:

1. Limited training dataset

The YOLO model is trained on only 200 images, which may introduce selection bias and limit generalization.

We acknowledge that 200 annotated images is a relatively small dataset. However, as described in the manuscript, we employed a transfer learning approach using a pre-trained YOLOv8n model, which has already learned generalised feature extraction capabilities applicable across new domains. Fine-tuning such a model on a smaller domain-specific dataset is a well-established practice. Nevertheless, we acknowledge that expanding the training dataset in future work would further strengthen the model's generalisation capability.

1. Subjective ground truth

Manual labeling introduces subjectivity. Clearer quantitative criteria for LIME identification are needed.

We understand that the manual labeling process is subjective and that explicit quantitative criteria for LIME identification were not formally defined in this study. The annotation was guided by the primary visual characteristic of LIME, isolated radar echoes appearing at approximately 60 km altitude with clear spatial separation from D-region echoes at higher altitudes. As this work represents a first application of automated object detection to LIME identification, establishing a fully objective, quantitative annotation protocol was beyond the scope of the current study.

Minor comments:

- Improve figure labeling (units, descriptions etc)
- Clarify uncertainties
- Check spelling and grammar

We will carefully revise all figures to improve labeling, including units and descriptions. We will clarify all the uncertainties. The spelling and grammar of the entire manuscript will also be checked and corrected in the revised version.