

**Author's Response:**  
**GHGPSE-Net: A method towards spaceborne  
automated extraction of greenhouse-gas point  
sources using point-object-detection deep neural  
network**

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We are glad to see that our manuscript has been accepted for publication. We sincerely thank the editor and reviewers for the valuable comments and suggestions. We appreciate the editor's effort in telling us the relevant typesetting policies and, more importantly, for providing us with detailed comments on the technical issues in the manuscript. We've revised the manuscript accordingly and hope the revised version can meet GMD's requirements for publication.

Our detailed point-by-point responses to the topic editor are given as follows, where the topic editor's comments are in *blue italics* and our responses are in normal text.

## **Point-by-point Response to Topic Editor**

*Line 34: Make sure there are spaces before the citations.*

We have added spaces before all round brackets in the manuscript.

*Line 38: FRS-SS is not defined in the text.*

This is a typo. We have revised "FSR-SS" to "FSR-NS", which has been previously defined in the text.

*Line 95/96: This needs a persistent identifier (not just a website/github repo).*

We've now cited the technical documents (Skamarock et al., 2019) recommended by WRF developers.

*Lines 96-98: These schemes need references.*

We've added references for the physical schemes in the WRF-GHG model. The corresponding text has been revised as follows:

"... include the RRTM scheme (Mlawer et al., 1997) for longwave radiation, the Dudhia scheme (Dudhia, 1989) for shortwave radiation, the Kain-Fritsch cumulus parameterization (Kain, 2004) for the outermost domain, the YSU scheme (Hong et al., 2006) for the planetary boundary layer (PBL) parameterization, the Monin-Obukhov scheme (Monin and Obukhov, 1954) for the surface layer, the WSM5 scheme (Hong et al., 2004) for microphysics, and the NOAH scheme (Chen and Dudhia, 2001) for land surface model (LSM)."

*Line 112: Which version of EDGAR are you using?*

The version of EDGAR inventory we used is v8.0, which has been added in the text.

*Line 152: A space is needed after the full stop.*

We've corrected this typo accordingly.

*Equation 3: A full stop is needed after the equation.*

We've corrected this typo accordingly.

*Line 174: These neural networks should be spelled out in full.*

We've revised the corresponding text as follows:

" There are two main paradigms, anchor-based neural network and anchor-free neural network. The anchor-based networks, such as Single Shot MultiBox Detector (SSD) (Liu et al., 2016) and Mask Region-based Convolutional Neural Network (Mask R-CNN) (He et al., 2017) ... "

*Line 268: Please say (at least the country) where these power plants are located.*

We have added the location information of the power plants in the text as follows:

"... including Boxberg, Jänschwalde, Lippendorf, and Schwarze Pumpe in Germany, and Turów in Poland."

*Line 284: Please write the month names in full.*

We've corrected this typo accordingly.

*Line 314: Space needed after "v.s."*

We've corrected this typo accordingly.

*Table 3: It's not clear why one row is in bold font.*

The bold font was intended to highlight the best performance among instruments. To avoid confusion, we have removed the bold font.

*Line 402: Space needed after PBL.*

We've corrected this typo accordingly.

*Line 427: Please ensure all code/data sets have a reference that appears in the reference list (e.g. Pang, Y. (2025). Source code for "GHGPSE-Net: A method towards spaceborne automated extraction of greenhouse-gas point sources using point-object-detection deep neural network". Zenodo. <https://doi.org/10.5281/zenodo.17417618>).*

We have cited the source code in the reference list as recommended, and the corresponding text has been revised as follows:

" The codes, scripts, XCO<sub>2</sub> snapshots generated by WRF-GHG and other datasets used are available at <https://doi.org/10.5281/zenodo.17417618> (Pang, 2025a). The WRF-GHG codes, configurations, initial conditions, boundary conditions and emission files are available at <https://doi.org/10.5281/zenodo.17337441> (Pang, 2025b). The GONGGA flux inversion dataset is publicly available at <https://doi.org/10.5281/zenodo.8368846> (Jin et al., 2024). The SMARTCARB simulations are publicly available at <https://doi.org/10.5281/zenodo.4034266> (Kuhlmann et al., 2019, 2020)."

## List of Changes

We have made the following changes in the revised manuscript:

1. We corrected all the typos pointed out by the topic editor.
2. We added citations for the physical schemes in the WRF-GHG model and the technical documents recommended by WRF developers.
3. We clarified the power plant locations in the text.
4. We corrected other technical issues pointed out by the topic editor.

## References

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