



Generalized Framework for the Evaluation and Comparison of Atmospheric Chemistry Models with Observations



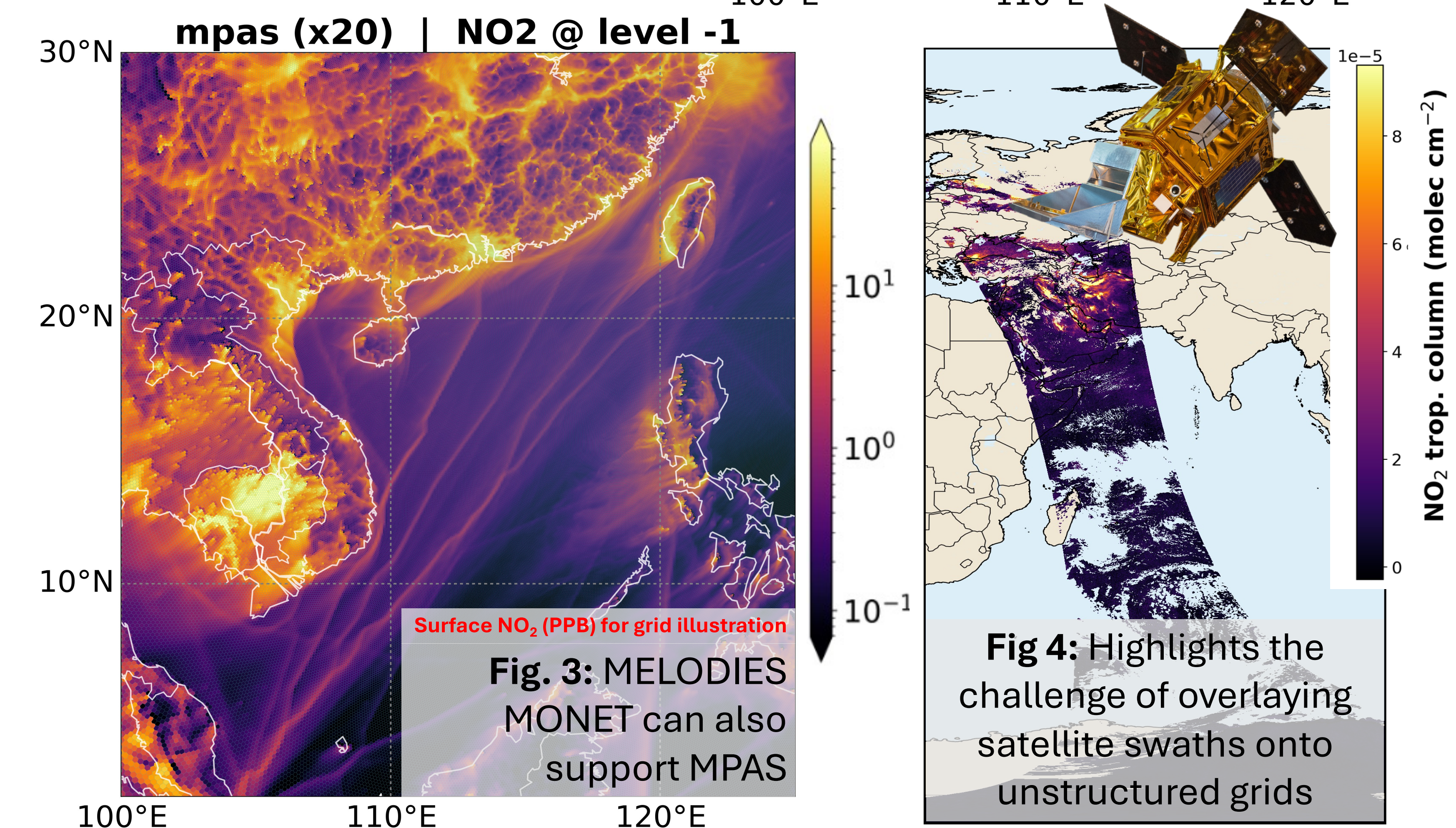
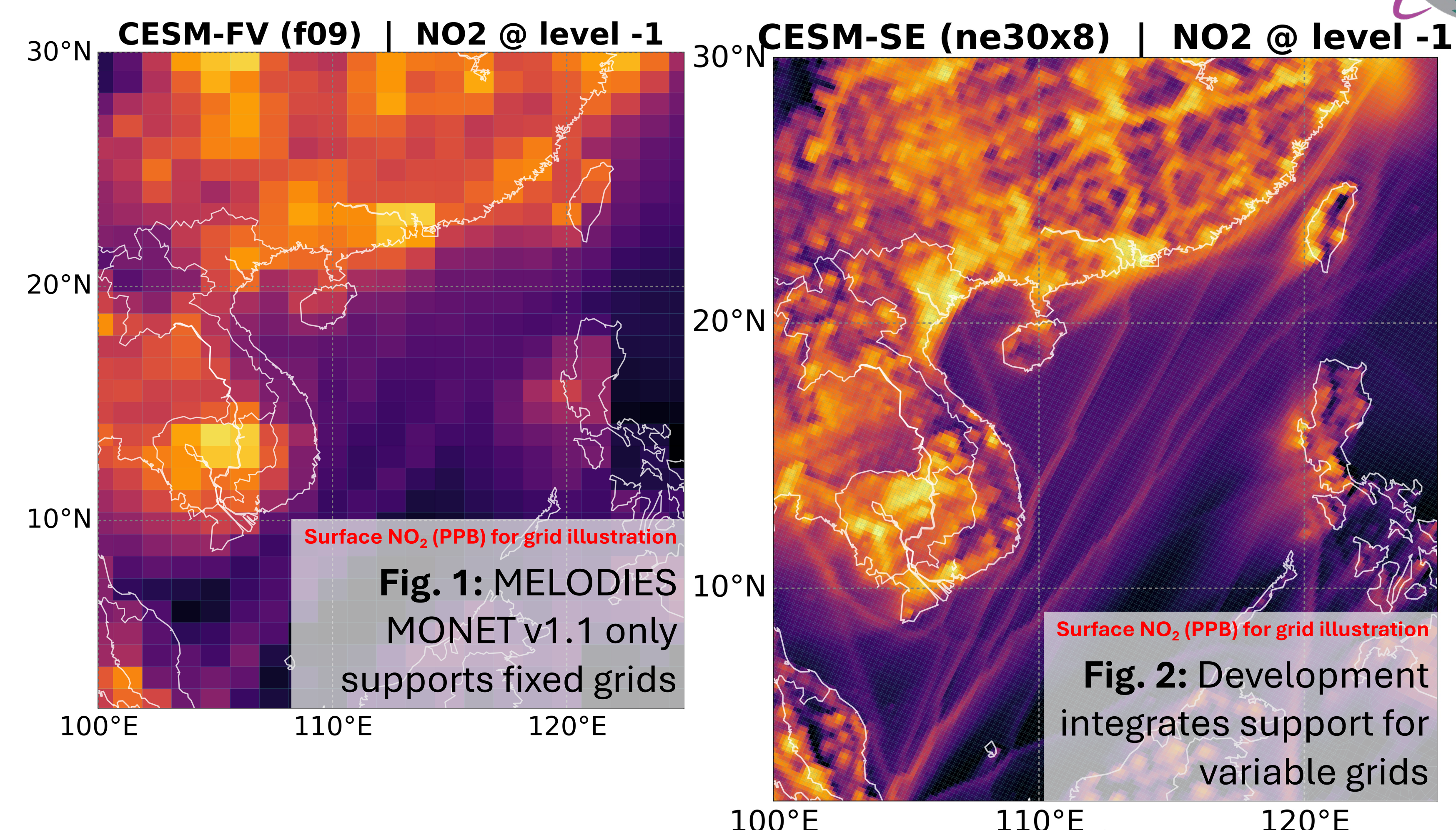
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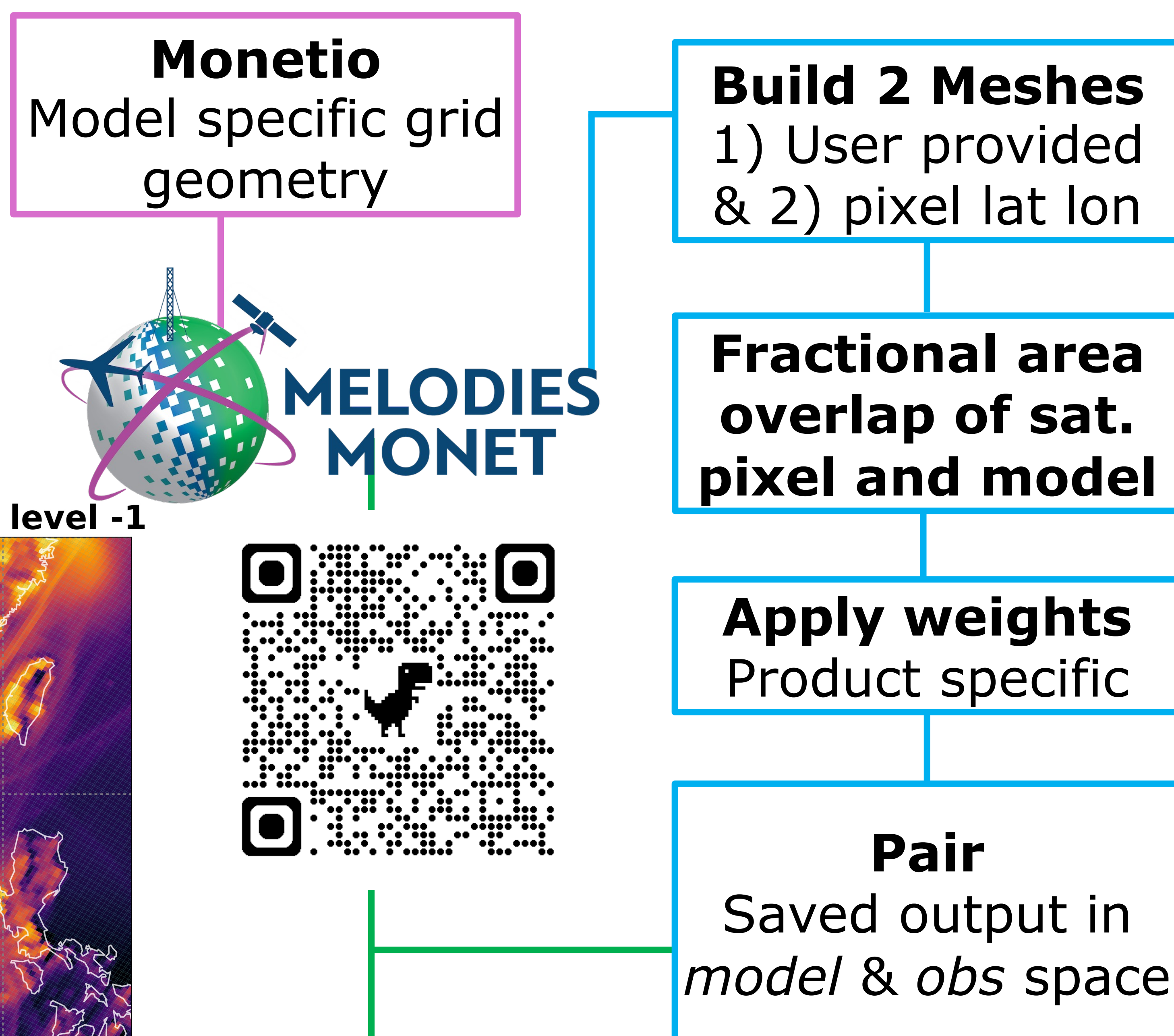
i) Background

- Atmospheric chemistry and air quality datasets are derived from *surface-, aircraft-, & satellite-based observations*
- Different *temporal & spatial* representativeness
- Support** NSF NCAR's & NOAA's *community & open-source model evaluation tool*

ii) Complex Grids & Observations



iii) Unstructured Grids & Conservative Satellite Pairing



This diagram shows the new unstructured model reading, through **Uxarray**, and conservative satellite pairing workflow

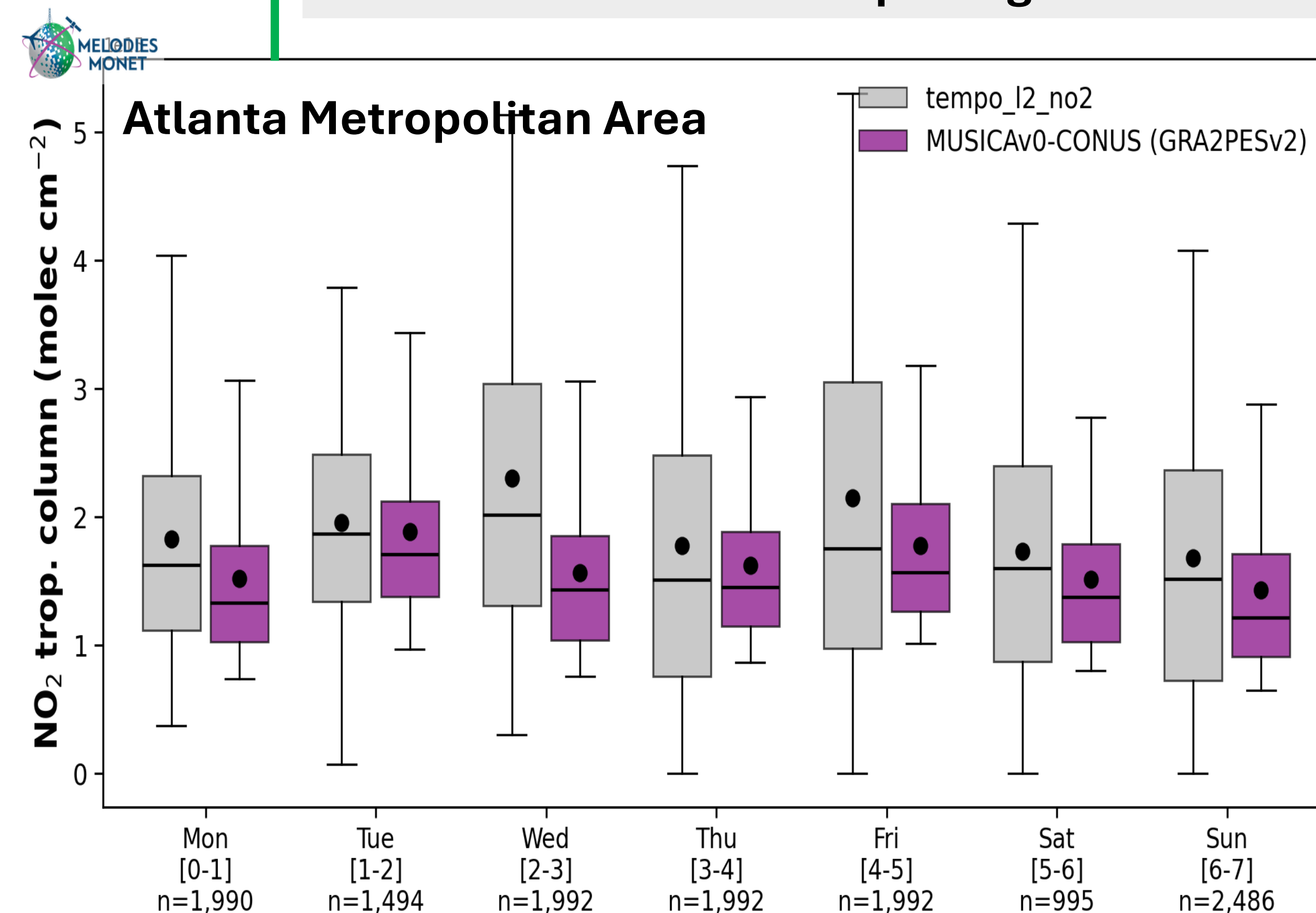


Fig. 5: Plots available in MELODIES MONET can provide weekly comparison of tropo. column TEMPO NO₂ to the MUSICA0-CONUS grid across the ATL Metro

iv) Conservative Regridding

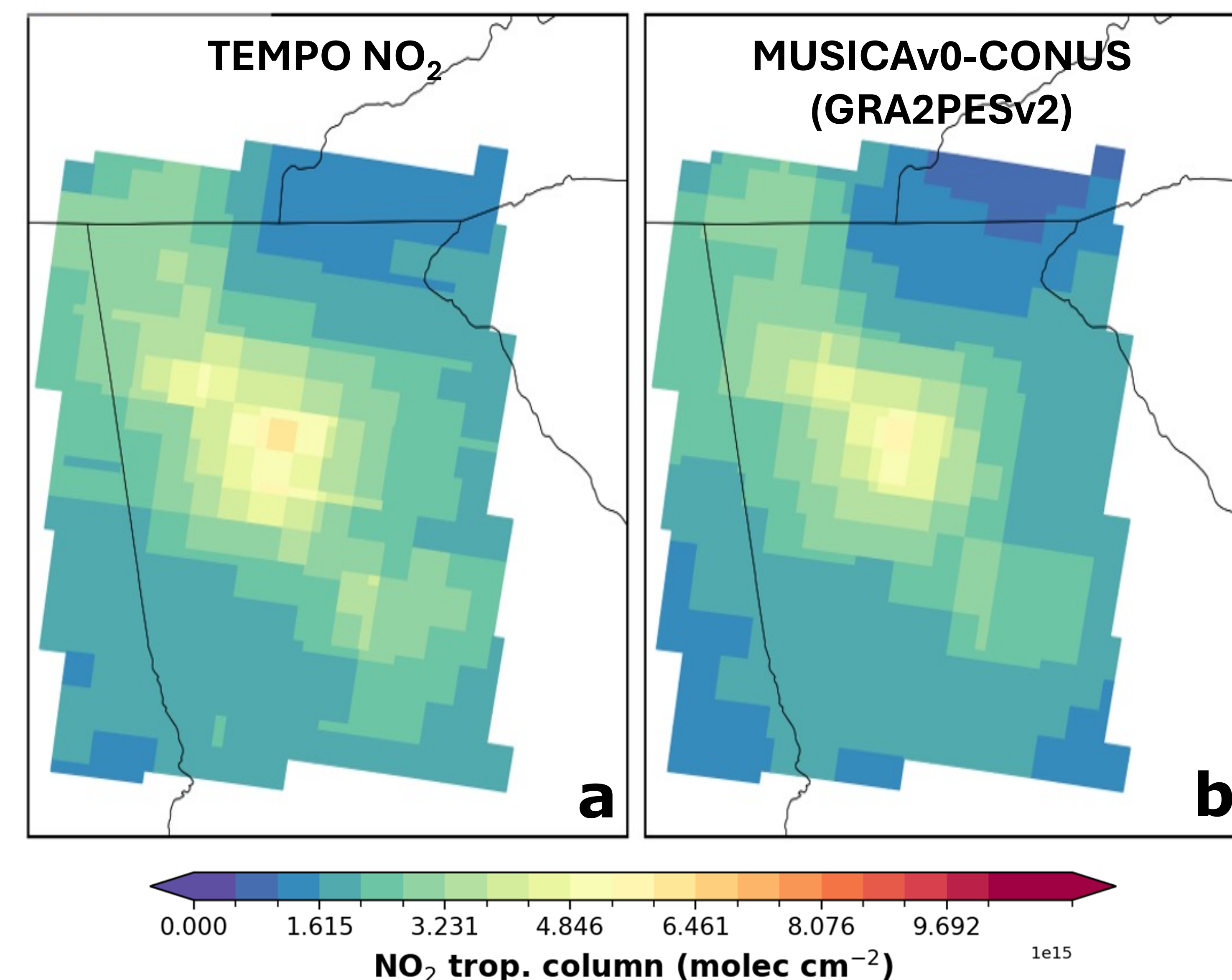


Fig. 6a-b: Paired TEMPO & MUSICA0 tropo. NO₂ vertical column densities over Atlanta, Georgia

v) Conclusions & Highlights

- New pairing, plotting, and comparison of unstructured model grids to surface, aircraft, and satellite observations through Uxarray & XRegrid
- MELODIES MONET conservatively regrids model & satellite obs onto unstructured & arbitrary grids to facilitate model intercomparison with observations
- New development is supporting NSF SCENICS & NASA HAMAQ campaigns
- Continue developing MELODIES MONET capabilities to unify Earth observing systems (satellite, aircraft, surface, & model)

vi) Acknowledgements

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