

We wish to thank the referee for his/her helpful comments. His/her full comments are copied hereafter in normal black font, and our responses are inserted in blue.

Many thanks for submitting the revised manuscript, in which my comments were satisfactorily addressed. The revised title is more appropriate, and the clarity of the writing has improved. I also welcome the conceptual figure that has been added.

One of the main outcomes of this study is that the magnitude of the NO_x emission reduction in the CIF-CHIMERE inversion system is highly dependent on the choice of super-observation errors. Currently, the authors steer clear of providing any specific recommendations to the community about the choice of the (super-)observation errors, other than the factual statement that choosing “optimistic” errors leads to a better agreement with emission reductions reported in the prior inventory compared to an inversion with conservative uncertainties. I would encourage the authors to provide some additional reflection on this in the conclusions. Would your results provide sufficient evidence to suggest the community to use these optimistic errors? Or would additional, targeted experiments be needed to be able to conclude this, and if so which ones?

Indeed, we consider that further work is needed to provide guidance for the configuration of the observation errors associated to super-observations, via a robust estimate of the relative weight between the NO₂ TVCD retrieval errors that are correlated in space and the total retrieval errors, and the characterization of the spatial correlations in the former. Miyazaki et al. (2012) and Boersma et al. (2016) had made a step forward by representing the error correlation between retrievals, based on the consideration that errors in clouds, albedo, a priori profile, and aerosol in retrievals are typically correlated in space, but they acknowledged that the exact number is difficult to estimate. In-depth analyses of the involved variables and evaluation of the uncertainty associated to the retrievals would be valuable.

We have changed sentences in the conclusion : « **Our results, with OMI and TROPOMI data but also with different choices made for the derivation of the error associated with each super-observation, lead to different magnitudes of corrections on NO_x anthropogenic emissions. This suggest that more observational constraints and further work would be required to sharpen the European emission estimates. Observational information from future satellite missions such as Sentinel-4 on board geostationary satellites would increase the number of observations for better constraining the NO_x emissions in particular for Eastern andNorthern countries. However, even if considering the corresponding increase in the observation sampling and weight, there is a particular need for in depth analysis of the spatial correlations of the error components in the TROPOMI and OMI NO₂ TVCD retrievals to support the configuration of the errors on super-observations, as recently highlighted by Rijdsdijk et al. (2025).** »