

## ***Interactive comment on “Statistical modelling of collocation uncertainty in atmospheric thermodynamic profiles” by A. Fassò et al.***

**A. Fassò et al.**

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Answer to referee #1

We thank the referee for his/her comments and in particular for giving us the possibility to discuss the issue of modelling functional data that are spatially correlated. In this manuscript, the spatial dependence is not considered directly mainly because we are dealing with the collocation mismatch in space at only two sites. We agree that a direct modeling of the spatial dependence of the atmospheric profiles could improve the study of the essential climate variables and the associated uncertainty quantification. In that respect, we will add a paragraph in order to give an idea of the state-of-art in modelling spatially correlated functional data and to discuss how atmospheric profiles could be

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modelled, even taking into account covariates as in [1], and the uncertainty assessed in a future research with data available at many sites in a larger spatial domain.

As for minor comments, we will follow your suggestions.

[1] R. Ignaccolo, J. Mateu, R. Giraldo (2013) Kriging with External Drift for functional data for air quality monitoring. Stochastic Environmental Research and Risk Assessment. DOI: 10.1007/s00477-013-0806-y

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