

## ***Interactive comment on “Spatio-temporal approach to moving window block kriging of satellite data” by Jovan M. Tadić et al.***

### **Anonymous Referee #1**

Received and published: 17 October 2016

Manuscript Number: gmd-2016-192 Title: Spatio-temporal approach to moving window block kriging of satellite data Author(s): J. M. Tadić, X. Qiu, S. Miller, and A. M. Michalak.

This paper intended to introduce an improved spatial-temporal approach to moving window block kriging of satellite data. It provided technique details of the method and compared its performance with spatial-only methods based on three datasets. The accuracy was validated using leave-one-out cross-validation. It is a well prepared and articulated paper. However, some minor issues need to be addressed before publication. I also provide a couple of references at the end of the comments for the authors to further improve the paper.

1. The aims of this study are scattered in the introduction and should be clearly pre-

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sented in the end of the introduction. 2. As to spatial-temporal approach, it seems some recent developments since 2011 have been missed, which should be included. Please see reference 1 for details. 3. Samples size is missing for the three datasets. Please provide. 4. It is not clear what software was used for this study. Please refer your readers to it so that they could apply your method to their study. 5. The accuracy measures used, MAE and RMSE, are data unit/scale and variation dependent as detailed in reference 2. Please see the recommendations in this reference for accuracy measure selection. 6. A statistical test of the cross-validation results in Table 1 may provide more convincing evidence to show the difference between the methods compared. 7. The conclusion: it is largely repeating what has been presented in the previous sections. It could be condensed by removing the repetitions.

Some further minor issues: 1. Spell out GOSAT, IASI and GOME-2 in the abstract or delete them. 2. Lines 98-99: this sentence suggests that the method is only applicable for a small region. Please revise and clarify. 3. Lines 144-145: are 'generalized product-sum model' and 'generalized product-sum covariance model' the same? Please keep the name consistent in the paper. 4. Line 173: delete one 'then'. 5. For XCO<sub>2</sub>, only 6 days data were used. Is this too short for ST method? Is it a factor for the poor performance of ST method? 6. Lines 345-346: ST method seems not that poor for GOME-2 data. Please revise.

Refs: 1. J. Li, A. D. Heap, Spatial interpolation methods applied in the environmental sciences: A review. *Environmental Modelling & Software* 53, 173 (2014). 2. J. Li, Assessing spatial predictive models in the environmental sciences: accuracy measures, data variation and variance explained. *Environmental Modelling & Software* 80, 1 (2016).

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