

Earth Syst. Dynam. Discuss., author comment AC1  
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## Reply on RC1

István Dunkl et al.

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Author comment on "Process-based analysis of terrestrial carbon flux predictability" by  
István Dunkl et al., Earth Syst. Dynam. Discuss.,  
<https://doi.org/10.5194/esd-2021-38-AC1>, 2021

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1. The 'perfect model framework' is mentioned in the introduction long before it is explained in the methods section. Adding a paragraph to the introduction to explain what the method is, where it has been used before, and its limitations, would help frame the paper better.

*We acknowledge the lack of description of this key method at an early point in the manuscript and are adding some context on the perfect model framework to the introduction.*

2 In the discussion section a paragraph could be added to explain the practical implications of the results. This is briefly mentioned in the last line of the conclusions but it could be fleshed-out better. As is, the paper does not do a good job of explaining why readers should care about the results.

*The main focus of the discussion is on the nature of the findings and some outlook is indeed needed. We are adding this to the discussion.*

Line 21: Be clearer here about whether you mean the seasonal cycle or annual variation in the 1st derivative of CO<sub>2</sub> concentration.

*To our understanding interannual is the term used to describe the differences between years, while intra-annual would be used for variations within years (season to season).*

Line 29: Unclear what "of emission reduction detection in the face of internal variability" means.

*The phrase refers to the problem of detecting the effect of carbon emission reduction policies by measuring the atmospheric CO<sub>2</sub> concentration. This is the case because small changes in emissions are overshadowed by the large natural variability of atmospheric CO<sub>2</sub> concentrations.*

Line 39: Change 'here' to 'therein'

*Text will be changed accordingly.*

Line 68: An abbreviation for standard deviation seems unnecessary. Also was the

abbreviation ever introduced?

*The abbreviation is introduced in line 22. We find it to be a useful and common abbreviation.*

Line 97: 'verification' is the wrong word to use here.

*We thank the reviewer to point out the mistake and we change the phrase to 'validation'.*

Figure 3: Rephrase caption to eliminate 'significant'. 'values above the 95\% confidence...' is good enough to convey the meaning with stepping on the land-mine of whether or not statistical significance is a metric that should exist.

*Text will be changed accordingly.*

Figure 7: Explain the yellow triangle in the figure caption.

*The legends to this figure were incomplete and will be extended.*