

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

István Dunkl et al.

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

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 CO₂ 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 CO₂ concentration. This is the case because small changes in emissions are overshadowed by the large natural variability of atmospheric CO₂ 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.