



*Supplement of*

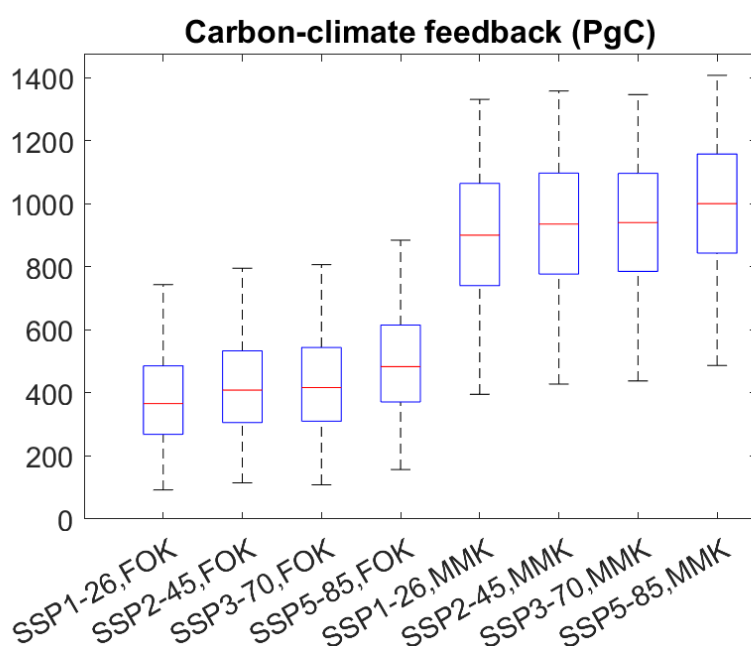
## **Carbon–climate feedback higher when assuming Michaelis–Menten kinetics of respiration**

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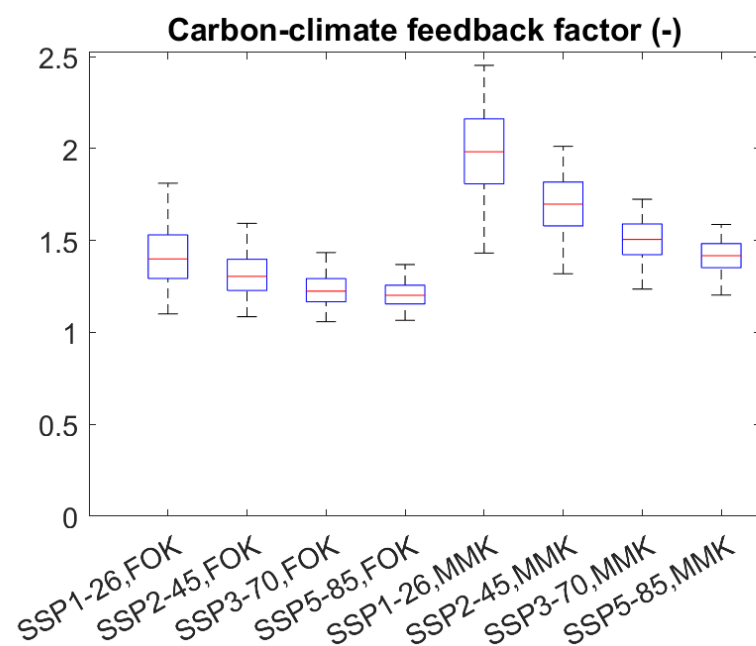
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This paper investigates the structural uncertainty of the carbon-climate feedback due to the mathematical formulation of respiration. Besides this structural uncertainty, an additional relevant source of uncertainty of the presented highly parametrized model is parameter uncertainty. To address this parameter uncertainty, and to compare with the estimated structural uncertainty, I selected two most sensitive parameters for the carbon-climate feedback (lambda and Q, Tab. 1 of the paper), resampled 100 pairs of both using Latin Hypercube Sampling and assuming a standard deviation of 0.4 for lambda and 0.2 for Q in order to derive a reasonable parameter range (lambda=[1.5,3.5] and Q=[1.6,2.6]), and repeated the feedback and feedback factor calculation and the respective model runs using these 100 samples of parameters. The results are shown in the two new boxplots below. We can see a clear parameter uncertainty, but the structural uncertainty of the formulation of the respiration equation is even higher. Mean values between FOK and MMK result distributions are significantly different. That means that despite the parameter uncertainty, the conclusions about the structural uncertainty hold.



**Figure S1.** Distributions of carbon-climate feedbacks (PgC) of both model versions (FOK and MMK) and for various carbon emission scenarios. Boxplots show the median, inter-quartile ranges and the minimum and maximum values.



**Figure S2:** Distributions of carbon-climate feedback factors (-) of both model versions (FOK and MMK) and for various carbon emission scenarios. Boxplots show the median, inter-quartile ranges and the minimum and maximum values.

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