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Interactive comment on “Parameter-induced uncertainty quantification of soil N₂O, NO and CO₂ emission from Höglwald spruce forest (Germany) using the LandscapeDNDC model” by K.-H. Rahn et al.

B. Ahrens

bahrens@bgc-jena.mpg.de

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General comments

The use of the Gelman/Rubin statistic \hat{R} needs some clarification, because the authors seem to have confused two definitions of \hat{R} and their respective threshold recommendations. Gelman et al. (2004) note that they have switched their definition of \hat{R} between the first and second edition of their book:

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$$\widehat{R}_{1st\ ed.} = \frac{n-1}{n} + \frac{B}{nW}, \text{ with a recommended threshold of } 1.2 \quad (1)$$

$$\widehat{R}_{2nd\ ed.} = \sqrt{\frac{n-1}{n} + \frac{B}{nW}}, \text{ with a recommended threshold of } 1.1 \quad (2)$$

In chapter 3.1 the authors use the square-root definition $\widehat{R}_{2nd\ ed.}$, but choose a convergence threshold of $\widehat{R} < 1.2$ from Kass et al. (1998) which refers to the definition of $\widehat{R}_{1st\ ed.}$. If indeed $\widehat{R}_{2nd\ ed.}$ was used, a threshold of 1.2 does not indicate that the four chains are near convergence. Furthermore, the densityplots of the 4 different chains in Figure 4 do not give a lot of confidence that the chains have indeed converged and should be used to construct a common sample from the posterior. The authors should check how they used \widehat{R} and its respective threshold and continue with the MCMC sampling using the proper convergence criterium, if necessary.

The proposed bi-modality of the parameter EFFAC (Fig. 4B) is not too convincing, as only two of the four chains sample both modes. Maybe the authors could address this bi-modality problem by trying stronger priors for this parameter or using the DREAM algorithm which is especially powerful when dealing with multimodality (Vrugt et al., 2009).

References

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