Interactive comment on “Parameter-induced uncertainty quantification of soil $\text{N}_2\text{O}$, NO and $\text{CO}_2$ 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.
\[ \hat{R}_{1st \, ed.} = \frac{n - 1}{n} + \frac{B}{nW}, \] with a recommended threshold of 1.2 \hfill (1)

\[ \hat{R}_{2nd \, ed.} = \sqrt{\frac{n - 1}{n} + \frac{B}{nW}}, \] with a recommended threshold of 1.1 \hfill (2)

In chapter 3.1 the authors use the square-root definition \( \hat{R}_{2nd \, ed.} \), but choose a convergence threshold of \( \hat{R} < 1.2 \) from Kass et al. (1998) which refers to the definition of \( \hat{R}_{1st \, ed.} \). If indeed \( \hat{R}_{2nd \, ed.} \) 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 \( \hat{R} \) 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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