

Interactive comment on “Topography induced spatial variations in diurnal cycles of assimilation and latent heat of Mediterranean forest” by C. van der Tol et al.

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Page 1632 Adaptation and acclimation

In the response to the second anonymous referee, we proposed replace the first two paragraphs with a declaration of the need to estimate long term and short term effects of climate. The use of the terms adaptation and acclimation perhaps raises the suggestion that we discuss competition, allocation of nutrients and other physiological processes, which is not the case. We propose to state in line 20 that vegetation parameters evolve as a result of these processes, but that they are not the topic of the paper.

Page 1632 line 6.

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The temperature dependence of parameters V_{cm} and J_m are often described with a Boltzman function. For this function, two parameters are required: optimum temperature and the sensitivity. It is likely that optimum temperature is adapted to the governing temperatures. The photosynthesis measurements were all carried out during daytime with temperatures between 26 and 30 C, and therefore, we do not know the temperature dependence. We did not correct the parameters for temperature, because this would raise the false pretention that our parametrization for temperature correction is physically based.

Page 1637 Farquhar's model:

We propose to state on line 21, just before Eq 3: 'In this model, photosynthesis is the minimum of Rubisco limited and electron (or light) limited carboxylation, less dark respiration. The mathematical formulation is:'

Because the model is well known and well described in literature, it is not necessary to elaborate on it.

Page 1642: leaf samples

Leaf samples were collected two times: one third of the samples was collected on 6 June and two third at the beginning of September. Leaf nitrogen content did not change, but leaf chamber measurements later in the season showed that V_{cm} did. We have not presented those results in this paper, because we focused on diurnal cycles in the absence of water stress instead of seasonal cycles.

Page 1643: Fitting V_{cm} , R_d and q

Fitted is a better term here than calibrated. J_m was not fitted because such would lead to multiple equivalent solutions. It is better to constrain the solution by fixing the ratio of J_m/V_{cm} .

Page 1646 Estimating V_{cm} for the plots

V_{cm} has been calculated from the data of Reich et al. (1999) by inversion of the Farquhar model, using otherwise the same parameter values as in the model that was

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used forward to calculate photosynthesis. Maximum photosynthesis is reached at sufficiently high irradiance, i.e. in the enzyme limited case, and thus using V_{cm} is equivalent to using maximum A .

The nitrogen content at the plots was relatively low, and the scale in Fig. 6 chosen accordingly. Because of the scale of this figure, data of Reich et al. (1999) with N concentrations above 1.7 g/(100g DM) are not visible in the graph. No other selection criterion was used.

Appendix B, Eq. B2

In the limiting case of x approaching 1, the nominator of both equations goes to 1. To be more precise, we could define the equations for $x>1$, $x<1$ and for $x=1$: $k = \sqrt{(x^2 + \tan^2(\theta)^2)}$

We will respond to the suggestion of collecting literature values of V_{cm} for *Fraxinus ornus* and *Quercus pubescens* in a few days.

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