

## ***Interactive comment on “ORCHIDEE-SRC v1.0: an extension of the land surface model ORCHIDEE for simulating short rotation coppice poplar plantations” by T. De Groote et al.***

**P.-E. Jansson**

PEJ@kth.se

Received and published: 15 August 2014

### General Comments

The paper is demonstrating how a modified version of the Orchidee-FM was developed to describe a common short rotation forest. The Orchidee model is developed for global land surface applications and the current papers deals with an updating to not only a new forest management scheme but also to a local scale of two sites in the same climate region of the world. In the objective it is clearly stated that the purpose was to modify the model to now cover a range of site conditions for SRC systems. Two modules (Allocation are changed that are related not only to parameters but also to the

C1397

structure of the model. Both of those are typically very empirical in forest modelling and not always easy to describe also for more conventional forest management systems. The paper does not make any review of process oriented modelling of SRC system on a plot scale. Many such have been made for both water, carbon and nitrogen studies. Instead it makes use of mainly eddy flux data from 2 recently established sites to support a modifications. The paper is of high interest for users and developers of the Orchidee model but the general interesting issues for how to model SRC systems is lacking.

### Specific Comments

The evaluation criteria for the acceptance of the new model is based on simple conventional statistics. Those statistics shows to my understanding only to what extent the seasonal course of the major fluxes can be described by the model. The improvement with respect to the conventional Orcidee PFT 6 is described without considering the methods for calibration. The authors need to clarify why the evaluation criteria was selected and to what extent the subjective evaluation of those conventional statics is a very well performing model and this proved to be useful tool to predict biomass productions for SRC plantations in general. The authors are recommended to evaluate the model on NEE rather than ecosystem respiration and photosynthesis. Otherwise pleas justify the meaning of the separate components. . . The more detailed evaluation of the model showed some major problems that are of higher scientific interest. 1)The Seasonal courses as presented in Fig 3. Showed interesting deviations between simulated and measured fluxes. Most obvious was with respect to Sensible heat flux. NEE, LE and H all shows substantial differences in the seasonal patterns. Since only those represent the original measured variables it would be of high interest to know why they very not used to evaluate the quality of the model performance . The discrepancy with respect to sensible heat flux was disregarded by the authors since they argued that it did not have any coupling to C or Water cycle in the model. This statements needs clarifications. The sensible heat flux is normally fully linked in an energy balance equations

C1398

and if considered in the model it should have some meaning for other components. I suppose the sensible heat flux should be consistent with the surface temperature of the site. This section is recommended to be excluded from the paper if it can't be justified from a reasonable interpretation. Maybe the particular boundaries to the specific sites are representing a scale for which we can't close the energy balance or something is wrong in measurements or in the model. 2) The evaluation is fully lacking information about state variables in the soil. One such is the soil temperature and soil moisture and another is the root depth and allocation of carbon to the fine root system. This may be one of the most interesting components to be compared with an conventional forest site. I expect some comments to those soil conditions and especially with respect to modified allocation procedure this was suggested for the orcidee-SRC model.

#### Concluding remarks

The paper demonstrates a first approach to develop a global model to a specific forest management system. However to make the model of general interest outside the internal modelling community for the Orcidee groups it need substantial modifications. As an internal working document the paper the may be useful.

---

Interactive comment on Geosci. Model Dev. Discuss., 7, 4019, 2014.