

**Comments to the authors of GMDD. (Szczypta et al.):**  
**General comments and overall evaluation:**

The validation of land surface models is very important to find the way improving their estimation accuracies. Szczypta et al. did the interesting work on model validations of ISBA-A-gs and ORCHIDEE with newly organized LAI and soil moisture data sets for 1991-2008. The efforts reveal the moderately large difference between models and observation in LAI estimation probably due to insufficient model parameterization and due to improper model structure, leading to further brushing up of both models for LAI estimation. Also ISBA seems to have relatively good accordance in surface soil moisture with ESA-CCI products. However, this paper is suffering from following points.

First of all, the originality and/or advantage of this study are not clear. I know that two models have been assessed their accuracies on LAI and SSM (only for ISBA), individually so far. Although the satellites data of this study are newly prepared long-term record of LAI and SSM, it does not guarantee their higher accuracies compared to previously organized other data sources. I like to know more precisely about the originality and/or advantage for this model validation when compared to previous model validation papers on both models. Especially, no validation of SSM for ORCHIDEE reduces the value of this paper. I think that ORCHIDEE also has soil moisture outputs, which could be converted into similar soil moisture variable to be compared to satellite SSM. So I hope that you can show us the SSM analyses with ORCHIDEE's estimation. If it's impossible, you have to mention more precisely the reason why ORCHIDEE could not produce the SSM value.

The comparability of satellite-derived SSM data has not been that much discussed. The satellites detect the SSM only for first several centimeters, which does not necessarily match with the depth for which the plants will take up the water for growth and the models take into account. So it will invoke the incomparability between model and satellite. This issue is mainly from insufficient explanation on which soil layer with how large depth of ISBA-A-gs the authors took up for comparison.

Minor thing is that the authors change the order of explanation on two variables: SSM and LAI. In Introduction you explained firstly about LAI and secondarily about SSM. But, in Result and Discussion section, you did it firstly about SSM and secondarily about LAI. Also you put the figures in the panel from Fig 6 to Fig 11 in the order of ISBA, ORC, GEOV1 or ORC, ISBA, GEOV1, or GEOV1, ISBA, ORC, separately. It is not intuitively easy to understand. You have to unify them.

**Minor comments:**

**Page 5554, Line 1-5:** I do not think that the authors have investigated deeply the drought effect on vegetation this time. You rather did the validation between model and satellite products, meaning that you explored how nicely the models represent the seasonal and interannual changes in LAI associated with SSM (though only for ISBA).

**Page 5556, Line 23-24:** Is it right? I think that ORCHIDEE also has several soil layers, which definitely can produce the variables concerning soil moisture. You have to explain the reason why you excluded ORCHIDEE in that analysis more precisely.

**Page 5557, Line 6-8:** I have no objection on this projection of climate forcings onto half degrees although the spatial and temporal variabilities of climate data should be more or less smoothed when projected onto finer resolutions. But, I like to know why you had to do it. I guess that it is because ORCHIDEE and/or ISBA have other ancillary data only on half degrees. Anyway write the reason.

**Page 5557, 2.1.1 and 2.1.2:** I think that it is easier for readers to understand when you explain the models from ISBA but from ORCHIDEE because hereafter you address the result and make the figures in the order of ISBA, ORCHIDEE normally.

**Page 5557, Line 21-:** What's the temporal resolution? Write it.

**Page 5558, Line 20,** Did you compare the soil moisture of this 'thin surface layer' to the SSM by ESA-CCI? Clarify it.

**Page 5559, Line 6-8:** ISBA has been already assessed its accuracy on LAI estimation, and ORCHIDEE also has been checked that several times previously. So what is the point of this research?

**Page 5560, Sec. 2.2:** I like to know the accuracy of this SSM dataset and how deeply in the soil it can detect soil moisture. Explain it. Also I like to know the original temporal resolution of satellite detection of SSM.

**Page 5563, Line 25-Page 5564, Line 1:** It also shows that 2003 year does not affect that much on consistency in correlation between ESA-CCI and ISBA. More than that, it also shows that AMSR-E has quite lower correlations with ISBA, which suggests that AMSR-E SSM are quite different with other SSM satellite data sources, and that ISBA may provide the reduced accuracy on SSM estimation when AMSR-E products are assumed to be more accurate than other SSM sources due to its latest technic for detection. Another thing is that this part should be in Discussion.

**Page 5564, Line 17-19:** How do you count the values in terms of month? Because the days of month are different for each month, I feel that it is strange to use the unit of months to count the LGP. I think that 'days' is good unit enough for expressing the LGP.

**Page 5564, Line 26:** I am not so sure that there is a 1 month lag in leaf onset. ISBA appears 1 month lag in max LAI to GEOV1, but the timing of taking-off the bottom line is not that so clearly delayed to GEOV1 in my view. Along with the definition of leaf onset, it could be possible to have small or no delay when you describe the map of Fig 6.

**Page 5568, Line 12:** improving?

**Page 5588, Figure 6:** I think that the interval of colors would better be shorter than 1 month. Also I recommend you to put another Diff (ORC - GEOV1 and ISBA - GEOV1) figures. The order of panels of Fig6&7 are different to that of Fig. 8&9, and that of Fig 10&11. I prefer the order of ISBA, ORC, GEOV1 or GEOV1, ISBA, ORC for every figure as same order as you explained in the text.

**Page 5589, Figure 7:** The interval of colors should be shorter than 1 month to know the gradual change in value. Could be 2 weeks or 1 week.