Interactive comment on "Estimation of evapotranspiration through an improved daily global solar radiation in SEBAL model: a case study of the middle Heihe River Basin" *by Jingqiu Yin et al.*

Jingqiu Yin et al.

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Dear Nadja den Besten, Thank you for all your feedbacks and comments about our work. All the questions you mentioned have been answered and have been revised. In addition, Dr. Liu's thesis can be downloaded from CNKI. You may not be able to download it, but I can upload it. At the same time, I checked the literature related to him and added it to the article.

1. L. 11 Response:I have deleted it. 2. L. 41-45 Response:I have revised in line

39-47 . 3. L. 76 Response:100 m×100 m 4. L.99 Response:Please look at line 219-224 5.L.101-104 Response:I have revised,and added this content in line 106-110 6.L.110-111 Response:I have revised.We got the data from the old website, but they've changed now.The land cover data on the Internet can't meet our requirements. It was made by Dr. Li, one of the authors, who also used it in his article. 7.L.144 No. b is right. 8.L.193 Response:Yes, surface albedo is moderate sensitive to ET, but the LST and daily GSR are more sensitive than it(Liu ,2008, Zheng et al.,2016, Xia,et al.,2013). âŚă In the study period, except for the amount of cloud, other weather conditions are the same, and there is no rainfall. âŚąWe also find that the surface albedo and NDVI are almost unchanged, in several consecutive days. âŚćwe also find that the surface albedo of MODIS from 21 to 24 is almost unchanged. âŚčIf the study period is discontinuous and the interval is long, the surface albedo can not be used. The third strategy is suitable for continuous multi day periodãĂĆ 9.L.210 Response:Please look at line219-224 10.L.231 Response:I have revised. 11.L.249-250 Response:I have deleted it. 12.L.255 Response:I have revised. 13.L.272 Response:Yes, the result is expected.I have revised, and added the tables. 14.L.282 Response:Heihe River is an inland river in arid and semi-arid region. In the middle reaches, all farmland irrigation water comes from of Heihe River, which is agricultural production water mentioned in the introduction of the article. 15.L.283-285 Response:I have revised in line 293-294. 16.L.305 Response:I have revised. 17.L.288-289 Response:I have revised. 18.L.337 Response:Yes, in this region , the water source of crop growth in the middle reaches of Heihe River is irrigated by Heihe River. So irrigated farmland show high ET rates. 19.349-453 Response:I have deleted it. 20.Maybe a flowchart will help to describe the methodology. Response:I have added it.
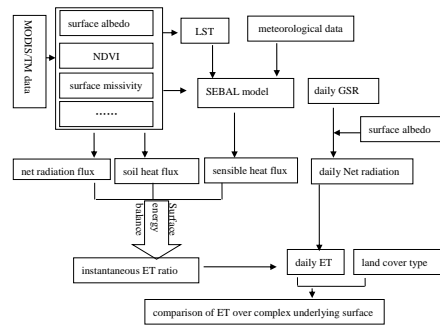
Fig.1. Flow chart of this study

Fig. 1.

Table 2
ET of three combination schemes on 24 June, 2009(Unit: mm)

Classification	farmland			wetland		
	measured ET	original scheme	improved scheme	measured ET	original scheme	improved scheme
TM strategy	4.8	6.3	5.0	2.2	4.7	3.5
MODIS strategy	4.8	6.3	4.2	2.2	4	2.6
TM/MODIS Hybrid strategy	4.8	7.0	4.8	2.2	4.7	3.1

Fig. 2.

Table 3
Errors of ETs of three combination strategies on 24 June, 2009(Unit: mm)

simulation strategy	simulation scheme	farmland		wetland	
		MABE	MABRE (%)	MABE	MABRE (%)
TM strategy	original scheme	1.5	31	2.5	114
	improved scheme	0.2	4	1.3	59
MODIS strategy	original scheme	1.5	31	1.8	82
	improved scheme	0.6	13	0.4	18
TM/MODIS strategy	original scheme	2.2	46	2.5	114
	improved scheme	0	0	0.9	41

Fig. 3.

Table 4

a. Daily ET of middle Heihe River Basin on June 21–24, 2009 (farmland) (Unit: mm)

Date	Measure ET	simulated ET		MABE		MARBE(%)	
		improved	original	improved	original	improved	original
6.21	4.9	3.8	6.6	1.1	1.7	22	35
6.22	5.1	3.9	6.5	1.2	1.4	24	27
6.23	4.5	4.4	6.6	0.1	2.1	2	47
6.24	4.8	4.8	7	0	2.2	0	46
Mean	4.8	4.2	6.7	0.6	1.85	12	39

b. Daily ET of middle Heihe River Basin on June 21–24, 2009 (wetland) (Unit: mm)

Date	Measure ET	simulated ET		MABE		MARBE(%)	
		improved	original	improved	original	improved	original
6.21	2.1	2.4	4.1	0.3	2	14	95
6.22	1.9	1.2	2.2	0.7	0.3	37	16
6.23	2.1	1.7	2.7	0.4	0.6	19	29
6.24	2.2	3.1	4.7	0.9	2.5	41	114
Mean	2.1	2.1	3.4	0.6	1.4	28	64

Fig. 4.