

## Response to Reviewer 2

### **Reviewer #2: General comment**

The authors produce a long-term eddy-covariance data set from two wheat-rice rotation cropland sites and two suburb sites in a typical East Asian monsoon region of Eastern China. They present and evaluate the general meteorological data, radiation data, turbulent fluxes, and CO<sub>2</sub> fluxes. The descriptions of the sites and methods are clear. They provide a valuable dataset, and the results are publishable. Therefore, I would like to suggest some adjustments that may help improve the study.

*Response:* Many thanks for your positive and valuable comments, and they were very helpful in refining the manuscript. According to your suggestions, we have supplied additional analyses to further substantiate our findings. We hope that this revision could address all your concerns in a satisfying manner. Now, we are responding these comments (in blue) item-by-item.

**Major comments:** As a descriptive manuscript related to the field monitoring data, it should present the details about the instruments and data process as much as possible. For example, what are the operating range, accuracy, and precision of the sensors used? How to process the data gaps in the datasets? Was in-filling performed on these gaps?

*Response:* Many thanks for your constructive comments. In the revised manuscript, we have provided more details.

- a. The operating range and accuracy of the sensors used at four sites have been added in Table 1.

**Table 1. Descriptions of the sensors used at four stations.**

Instrument	Site name	Variable (unit)	Model and manufacturer	Installation height (m)	Measurement range	Accuracy
Three-dimensional sonic anemometer	SX-cropland	three-dimensional wind speed ( $u_x$ , $u_y$ and $u_z$ m s <sup>-1</sup> ), sonic air temperature ( $T_s$ , °C)	CSAT3, Campbell	2.5	$u$ and $v$ : -65 to 65 m s <sup>-1</sup> $w$ : -65 to 65 m s <sup>-1</sup>	$u$ and $v$ : ±0.04 m s <sup>-1</sup> $w$ : ±0.02 mm s <sup>-1</sup>
	DT-cropland		CSAT3, Campbell	10	$T_s$ : -50 °C to 60 °C	$T_s$ : ±0.025 °C
	XZ-suburb		IRGASON, Campbell	16.5	$u$ and $v$ : -65 to 65 m s <sup>-1</sup> $w$ : -65 to 65 m s <sup>-1</sup> $T_s$ : -50 °C to 60 °C	$u$ and $v$ : ±0.08 m s <sup>-1</sup> $w$ : ±0.04 mm s <sup>-1</sup> $T_s$ : ±0.025 °C
	DS-suburb		CSAT3, Campbell	20	$u$ and $v$ : -65 to 65 m s <sup>-1</sup> $w$ : -65 to 65 m s <sup>-1</sup> $T_s$ : -50 °C to 60 °C	$u$ and $v$ : ±0.04 m s <sup>-1</sup> $w$ : ±0.02 mm s <sup>-1</sup> $T_s$ : ±0.025 °C
CO <sub>2</sub> /H <sub>2</sub> O open-path infrared gas analyzer	SX-cropland	CO <sub>2</sub> (mg m <sup>-3</sup> ), H <sub>2</sub> O (mg m <sup>-3</sup> )	EC150, Campbell	2.5	CO <sub>2</sub> : 0 to 1830 mg m <sup>-3</sup> H <sub>2</sub> O: 0 to 44 g m <sup>-3</sup>	CO <sub>2</sub> : < 1% H <sub>2</sub> O: <2%
	DT-cropland		LI-7500, LI-COR	10	CO <sub>2</sub> : 0 to 5148 mg m <sup>-3</sup> H <sub>2</sub> O: 0 to 42 g m <sup>-3</sup>	CO <sub>2</sub> : ±0.2 mg m <sup>-3</sup> H <sub>2</sub> O: ±0.02 g m <sup>-3</sup>
	XZ-suburb		IRGASON, Campbell	16.5	CO <sub>2</sub> : 0 to 1830 mg m <sup>-3</sup> H <sub>2</sub> O: 0 to 44 g m <sup>-3</sup>	CO <sub>2</sub> : 0.2 mg m <sup>-3</sup> H <sub>2</sub> O: 0.0035 g m <sup>-3</sup>
	DS-suburb		LI-7500A, LI-COR	20	CO <sub>2</sub> : 0 to 5148 mg m <sup>-3</sup> H <sub>2</sub> O: 0 to 42 g m <sup>-3</sup>	CO <sub>2</sub> : ±0.2 mg m <sup>-3</sup> H <sub>2</sub> O: ±0.02 g m <sup>-3</sup>
Four-component net radiometer	SX-cropland	Radiations (W m <sup>-2</sup> )	CNR4, Kipp & Zonen	1.5	$K_{\downarrow}$ and $K_{\uparrow}$ : 0.3 to 2.8 μm $L_{\downarrow}$ and $L_{\uparrow}$ : 4.5 to 42 μm	$K_{\downarrow}$ and $K_{\uparrow}$ : 5 to 20 μV W <sup>-1</sup> m <sup>-2</sup> $L_{\downarrow}$ and $L_{\uparrow}$ : 5 to 15 μV W <sup>-1</sup> m <sup>-2</sup>
	DT-cropland		CNR4, Kipp & Zonen	3		
	XZ-suburb		CNR4, Kipp & Zonen	26.5		
	DS-suburb		CNR4, Kipp & Zonen	1.5		

		Zonen				
Soil heat flux plate	SX-cropland	Soil heat flux ( $\text{W m}^{-2}$ )	HFP01, Hukseflux	-0.05	$\pm 2000 \text{ W m}^{-2}$	$\pm 3\%$
	DT-cropland		HFP01, Hukseflux	-0.05, -0.1, -0.2, and -0.4		
	XZ-suburb		HFP01, Hukseflux	-0.05		
	DS-suburb		HFP01, Hukseflux	-0.05 and -0.10		
Surface atmospheric pressure sensor	SX-cropland	Pressure ( $P$ , hPa)	PTB110, Vaisala	2.5	$P$ : 500 to 1100 hPa	$\pm 0.3 \text{ hPa}$ (20 °C)
	DT-cropland		PTB110, Vaisala	10		
	XZ-suburb		PTB110, Vaisala	16.5		
	DS-suburb		PTB110, Vaisala	20		
Air temperature and humidity	SX-cropland	Air temperature ( $T_a$ , °C) and humidity (RH, %)	HMP155A, Vaisala	2.5	$T_a$ : -80 to +60 °C $RH$ : 0.8 to 100 %	Depends on $T_a$ and $RH$
	DT-cropland		HMP45A, Vaisala	10	$T_a$ : -40 to +60 °C $RH$ : 0 to 100 %	$T_a$ : $\pm 0.2$ °C (20 °C) $RH$ : $\pm 2\%$ (0–90%) $\pm 3\%$ (90–100%)
	XZ-suburb		HMP155A, Vaisala	16.5	$T_a$ : -80 to +60 °C $RH$ : 0.8 to 100 %	Depends on $T_a$ and $RH$
	DS-suburb		HMP45C, Vaisala	20	$T_a$ : -40 to +60 °C $RH$ : 0 to 100 %	$T_a$ : $\pm 0.2$ °C (20 °C) $RH$ : $\pm 2\%$ (0–90%) $\pm 3\%$ (90–100%)

b. In terms of data gaps and gap-filling process in the dataset, detailed descriptions were added in Section 2.3 as follows (Lines 153–155):

“Note that EC data under unfavorable weather conditions (e.g., rainy and foggy days) or during periods of instrument malfunctions were excluded. However, there was no interpolation in the measurement, which can keep initial information of observations.”

**Minor comments:**

Lines 123–125: The installation height of the four-component net radiometers at SX-cropland and DS-suburb sites were same, please write them together as follows: “The four-component net radiometers (CNR-4, Kipp & Zonen B.V., Delft, the Netherlands) were mounted at 1.5 m for SX-cropland and DS-suburb, 3 m for DT-cropland, and 26.5 m above ground level (AGL) for XZ-suburb sites, respectively.”

*Response:* Corrected. (Line 124–126)

Lines 128–132: Similarly, the installation heights at four sites for air humidity, air temperature and surface air pressure were the same, please combine them.

*Response:* Many thanks for your kind comments. We have revised this sentence as follows (Line 129–132): “Other measurements including air humidity and air temperature (HMP155A; Vaisala, Inc, Helsinki, Finland at SX-cropland and XZ-suburb sites; HMP 45A; Vaisala, Inc, Helsinki, Finland at DT-cropland site, and HMP45C; Vaisala, Inc, Helsinki, Finland at DS-suburb site) and surface air pressure (PTB110, Vaisala, Inc, Helsinki, Finland) were at a height of 2.5 m at SX-cropland, 10 m at DT-cropland, 16.5 m at XZ-suburb and 20 m at DS-suburb site.”

Line 169: change “ $\lambda ET$ ” to “ $\lambda E$ ”.

*Response:* Corrected. (Line 175)

Lines 277–280: the sentence is better to modified as follows: “Take the Year 2016 as an example,  $\lambda E$  dominates the land–atmosphere heat flux exchange at two cropland sites (SX-cropland and DT-cropland). However, the dominant consumer of the  $R_n$  fluctuated between  $\lambda E$  and  $H$  at two suburb sites (XZ-suburb and DS-suburb), which could subsequently modulate the local climate.”

*Response:* We have revised this sentence as follows (Lines 285–287): “Take the Year of 2016 as an example,  $\lambda E$  dominated the land–atmosphere heat flux exchange at two cropland sites (SX-cropland and DT-cropland). However, the dominant consumer of the  $R_n$  fluctuated between  $\lambda E$  and  $H$  at two suburb sites (XZ-suburb and DS-suburb), which could subsequently modulate the local climate.”

Lines 260 and 263: “DT-Cropland” should be “DT-cropland”.

*Response:* Corrected. (Line 267 and 270)

Figure 1b: change the label “SX-cropand” to “SX-cropland”.

*Response:* Figure 1 has been revised as follows:

