The paper makes a significant contribution by modifying the Variable Infiltration Capacity (VIC) model to account for heterogeneous urban parameters, offering valuable insights into urban environment simulation. However, I have two major concerns regarding the validation process:

Reply: Thank you for your valuable feedback on our paper. We would like to address the concerns you raised below.

The primary contribution of this paper is incorporating various urban parameters. Despite this, the study was validated using data from only three stations, which may not be sufficient to represent the complexity of urban environments.

Reply: Thanks for the concern regarding the validation process. The simulated turbulent heat fluxes (latent and sensible heat) were evaluated using three ground-based observations. These are all the data for Beijing that can be obtained at present. To compensate this limitation, the VIC-urban model was further evaluated using land surface temperature data derived from the MODIS product (which covers the entire study domain), alongside 14 ground-based observations. Moreover, the simulated runoff was validated using streamflow data from three hydrological observations. Therefore, the evaluation or validation was done with respect to various hydrothermal fluxes and state, which guarantee the reliability of VIC-urban in representing the complexity of urban environments.

We acknowledge it is important to obtain more data to evaluate the model in future studies, and added relevant statements in the manuscript. Please see L516-520: *"The validation of the turbulent heat flues was not sufficient to reflect the model performance due to the scarcity of station data. However, the model was further validated using runoff and LST data obtained from gauge stations and MODIS product. These hydrothermal fluxes and states can be cross-verified based on the principles of water*

and energy balance, proving the reliability of VIC-urban in representing the complexity

of urban environments."

2. The authors claim that the VIC-urban model outperforms the standard VIC model. However, the results presented in Figure 9 show no significant difference in performance between the two models for two out of the three validation stations.

Reply: Among the three stations shown in Figure 9, the Miyun and the Daxing stations are located in suburban areas. Please note the improvements of the VIC-urban model primarily focuses on the urban areas rather than the suburban areas. Consequently, the VIC-urban and VIC models show similar performances at the two sites. We mainly focus on the Beijing station, which is located at the site with high-degree urbanization. VIC-urban performs better compared to the original VIC. Specifically, in comparing the sensible heat flux observed at the Beijing Station, the simulated values of VIC-urban model yielded a smaller RMSE ($\sim$12.7 W/m^2) than that of the VIC model ($\sim$15.7 W/m^2), with a higher correlation ($\sim$0.93) than the VIC model ($\sim$0.81).

We added relevant statements in the manuscript. Please see L391-397: "*As shown in Figure 9, the simulation results of the VIC-urban and the VIC models showed similar patterns at the Miyun and Daxing stations, as the two stations are located in suburban areas. The VIC-urban model mainly focuses on improving the model performance in urban areas rather than suburban areas. For the Beijing station, which is located at the site with a high degree of urbanization, VIC-urban provided a better performance. Specifically, the VIC-urban model yielded a smaller RMSE ($\sim$12.7 W/m^2) for the sensible heat flux than that of the VIC model ($\sim$15.7 W/m^2), and attained a higher correlation ($\sim$0.93) than the VIC model ($\sim$0.81).*"

To highlight the improvement, we provided a figure similar to the Figure 9 but exclusively using the data from the Beijing Station. The new figure is presented as Figure 1 below. But in the manuscript, we still use Figure 9 for completeness.
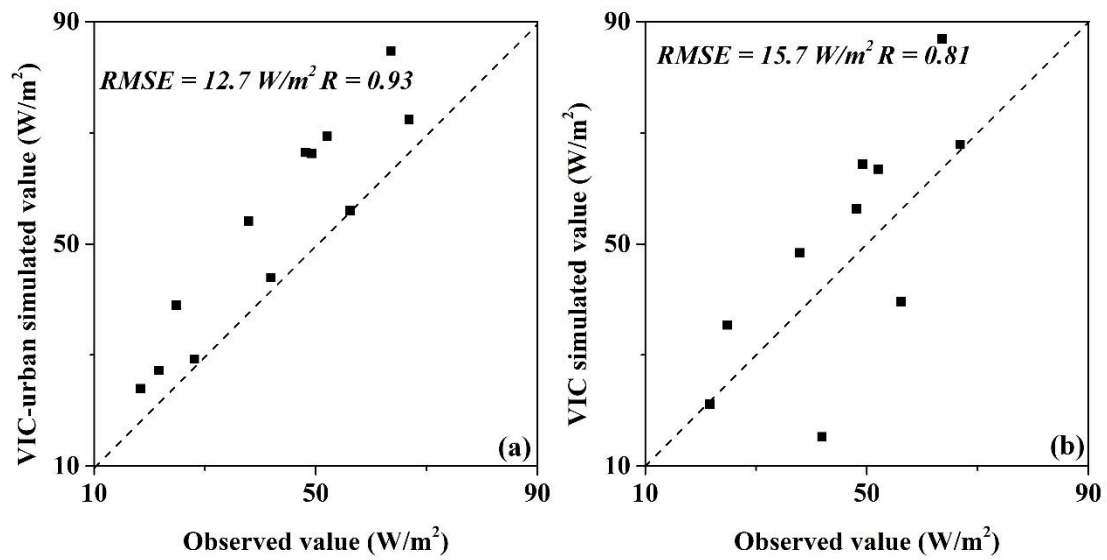
Figure 1. Simulated yearly turbulent heat fluxes of the VIC-urban (left) and the original VIC models (right) compared to the observed data at the Beijing station.