High temporal resolution surface heat fluxes are very important for land-atmosphere interactions. In this manuscript, land surface temperature from polar and geostationary satellite are both used and fed into surface energy balance equation. The results are validated with flux tower observations, and finally hourly surface heat fluxes with 5 km spatial resolution are generated over TP based on the developed SEB scheme. Generally, the manuscript is interesting and well written. It can be published with minor revisions.

Special comments:
- Page 2, Line 30: I think the authors missed an important kind of method (data assim-
illation method) for surface heat flux estimations based on remotely sensed LST. Some reference are as follows,


- How to derive 5 km and hourly surface heat fluxes with 10 km and 3 hour forcing data?

- In equation 5, sensible heat flux is represented as Hs, while it is H in equation 11. They should be the same in one manuscript.

- What is the time period of this study? as well as validation results in Table 3.

- Figure2: the ‘ITPCAS’ is a name of institute, not data. It should be changed into
‘Meteorological data’ or something else.

- Figure 3: the estimated G0 has a big bias against ground measurements. This is because G0 is parameterized with Rn. G0 and Rn do not have the same diurnal variation shape. The G0 peak values are usually later than Rn. However, the parameterization did not consider this. The authors may discuss this in the manuscript.

- Figure 4: usually, the observations were drawn by open cycles, and estimations are drawn by solid lines.

- Why Rn is underestimated from June to Aug. at BJ site in figure 4? Why H (LE) is underestimated (overestimated) from Jan. to May? The authors should give some explanations.

- Figure 5: the authors give two days of diurnal cycles over TP. The results are from which day and which year? It should be noted on figure 5. In addition, why you choose these two days?