General comments:

Urban heat storage (ΔQ_S) is a large component of the urban surface energy balance, and it can be up to 30-40% of net radiation. This paper presents a parameterized approach of Objective Hysteresis Model (OHM) coefficients, based on 1-D advection-conduction equation. That's an improvement comparing to original OHM. In addition, it also gives sensitivity analysis and model evaluation. It will be very important for urban surface energy balance study. I recommend acceptance after minor revision.

Specific comments:

(1) Page 1, line 14, it is recommended describing OHM limitation more clearly.

(2) Please check Eq.27 in page 7. Dose it maybe

$a_{3F} = -a_1 \frac{f_T}{f}(1-\alpha)\overline{K_\downarrow} - a_1 Q_F$?

Based on Eq.22, $\Delta Q_S = a_1(Q^* + Q_F) + a_2 \frac{\partial (Q^* + Q_F)}{\partial t} + a_{3F}$ when Q_F is included. With the assumption that Q_F is diurnal invariant,

$$\Delta Q_S = a_1(Q^* + Q_F) + a_2 \frac{\partial Q^*}{\partial t} + a_{3F}$$

$$= a_1 Q^* + a_2 \frac{\partial Q^*}{\partial t} + a_1 Q_F + a_{3F}$$

So $a_3 = a_1 Q_F + a_{3F}$, and $a_{3F} = a_3 - a_1 Q_F = -a_1 \frac{f_T}{f}(1-\alpha)\overline{K_\downarrow} - a_1 Q_F$.

(3) In page 10, a greater in incoming solar radiation ($K_{\downarrow}$) will lead to smaller $\Delta Q_{S,}$ why? In general, net radiation mostly depends on $K_{\downarrow}$, and the larger $K_{\downarrow}$, the larger net radiation which will lead to larger ΔQ_S.

(4) In Figure 5, the blue solid line (URB) is large differently from other lines in (a) and (c). Based on Figure 5a, the ΔQ_S can be up to 70% of net radiation, it's too large to believe. In addition, there's also large difference between simulation and observation in Figure 5a, 5b. Please explain them.