The exchange in HEX is considered *instantaneous*, whereas the evolution of the pipe took a time dt

Iteration t : t = beginning of the iteration, $t + dt$ = end of iteration

Known parameters:

$T_{return-NET}(t)$
$T_{storage-HOT}(t)$, $T_{storage-COLD}(t)$
$\dot{m}_{storage-INSTRUCTION}(t)$
$T_{supply-INSTRUCTION}(t)$
$\dot{m}_{return-NET}(t)$= $\dot{m}_{supply-NET}(t)$
$Ts_{nodes}(t)$ (list of temperatures at the beginning of each supply side pipe)
$Tr_{nodes}(t)$ (list of outlet temperatures of each return side pipe)
$(Tr1(t)\ (primary\ side\ return\ temperature), \dot{m}_{supply-SS}(t) = \dot{m}_{return-SS}(t))$ for each substation

Calculation process:

storage_cold → $Storage\_instruction\ (t)$ [$\dot{m}_{storage}(t)$]
uses and may modify $T_{return-NET}(t)$, $T_{storage-COLD}(t)$
calculates $\dot{m}_{NET}(t) = \dot{m}_{return-NET}(t) - \dot{m}_{storage}(t)$

GEO HEX → calculation of $T_{supply-NET}(t)$ (outlet primary temperature of the geothermal HEX) based on the knowledge of $T_{return-NET}(t)$ and $\dot{m}_{NET}(t)$

storage_hot → $Storage\_instruction\ (t)$ [$\dot{m}_{storage}(t)$]=> equilibrium with storage_cold
uses and may modifies $T_{supply-NET}(t)$, $T_{storage-HOT}(t)$
calculates $\dot{m}_{supply-NET}(t)$ = $\dot{m}_{NET}(t) + \dot{m}_{storage}(t)$

iter_returnside → evolution of the return pipes: calculation of $T_{outlet-pipe}(t + dt)$) based on $\dot{m}_{return-SS}(t) = \dot{m}_{supply-SS}(t)$ and $Tr_{nodes}(t)$ and $Tr1(t)$
→ Update $Tr_{nodes}(t + dt) = T_{outlet-pipe}(t + dt)$
→ calculation of $T_{return-NET}(t + dt)$

iter_supplyside → calculation of $P_{Boiler}(t)$ in order to increase supply temperature from $T_{supply-NET}(t)$ to $T_{supply-INSTRUCTION}(t) = Ts_{nodes}(t)[0]$
→ evolution of the supply pipes based on $Ts_{nodes}(t)$ => update $Ts_{nodes}(t + dt)$
→ $Ts1(t + dt)$ = $Ts_{nodes}(t + dt)$
→ Calculation substation HEX (instantaneous) => calculation of $Tr1(t + dt)$ and $\dot{m}_{return-SS}(t + dt)$ for each SS => we obtain $\dot{m}_{return-NET}(t + dt)$

$T_{return-NET}(t + dt)$ is calculated with $\dot{m}_{return-SS}(t)$. However, the return mass flow at $t + dt$ is $\dot{m}_{return-SS}(t + dt)$. Is that a problem?