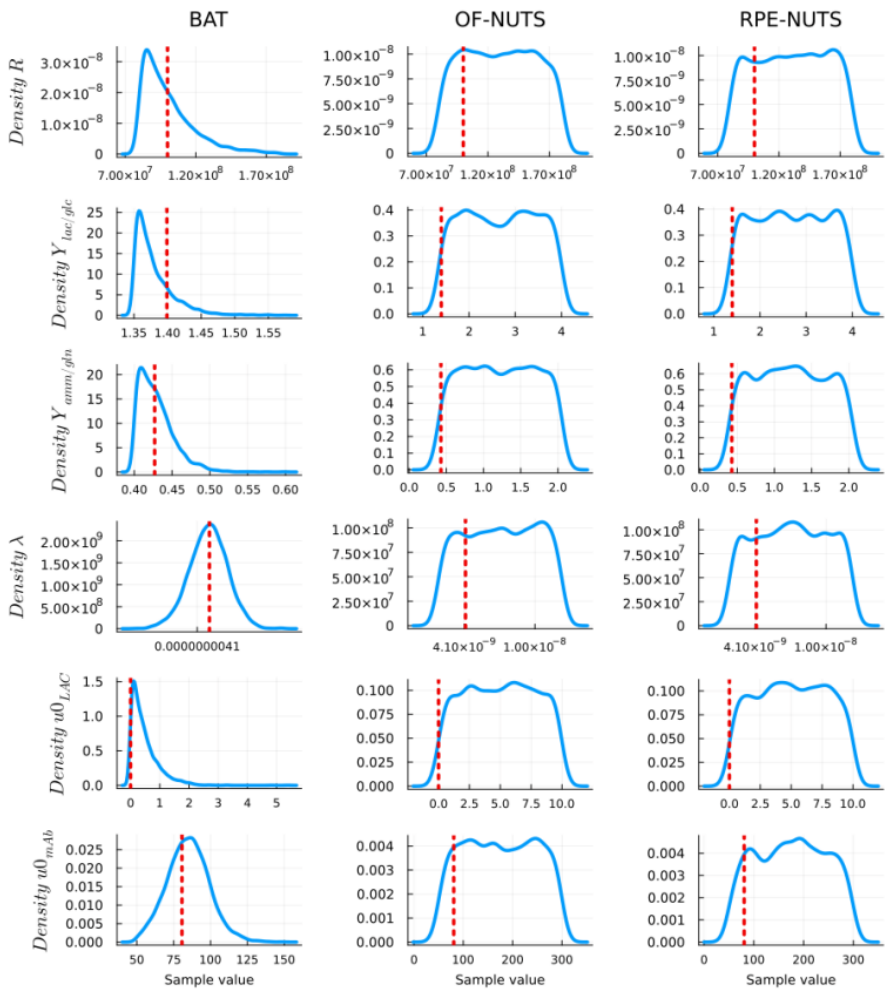

Figure 4. Distribution of the sampled values (for **R**, $u0_{LAC}$, $u0_{mAb}$, $Y_{lac,glc}$, $Y_{amm,gln}$, and λ) by BAT, OF-NUTS and RPE-NUTS with training set B1. OF-NUTS and RPE-NUTS estimated multimodal distributions, but BAT estimated unimodal distributions with peaks close to the ground truth values (red vertical dot line).

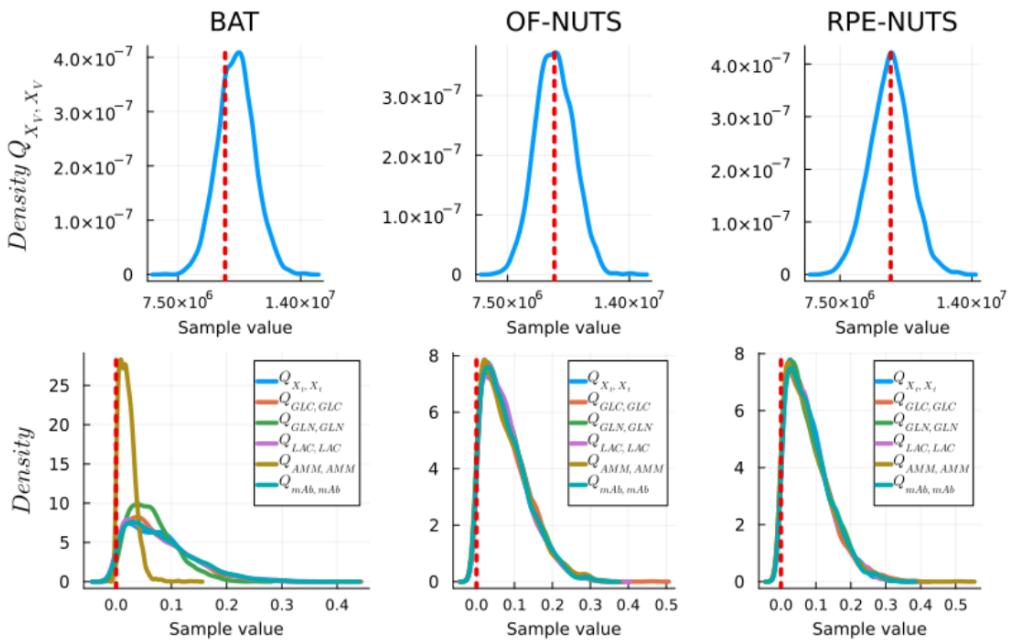

Figure 9. Distribution of the sampled values (for **Q** related to the seven state variables) by BAT, OF-NUTS and RPE-NUTS with training set B1. BAT, OF-NUTS and RPE-NUTS estimated unimodal distributions with peaks close to the ground truth values (red vertical line).

Table 2. Results of filter consistency test of the designed EKF with testing set B2 and B3 during the execution of task 2. $\times$ means unacceptable, $\surd$ means acceptable and SR means sample rate.

METHODS	TESTING SET B2 (SR=7H)	TESTING SET B3 (SR=7.5MIN)
OF-NUTS	$\surd$	$\times$
RPE-NUTS	$\surd$	$\times$
BAT	$\surd$	$\surd$

Table 3. RMSPE between designed EKF (during task2) and ground truth values of the testing set B3 (sample rate of 7.5 min).

STATE	BAT	OF-NUTS	RPE-NUTS
XV	2.41 %	6.39%	2.89%
XT	3.29 %	13.32%	2.46%
GLC	9.86 %	19.83%	6.19%
GLN	31.48 %	47.82%	45.22%
LAC	39.20%	144.18%	124.61%
AMM	4.77%	71.69%	53.58%
mAb	1.7%	84.49%	86.03%

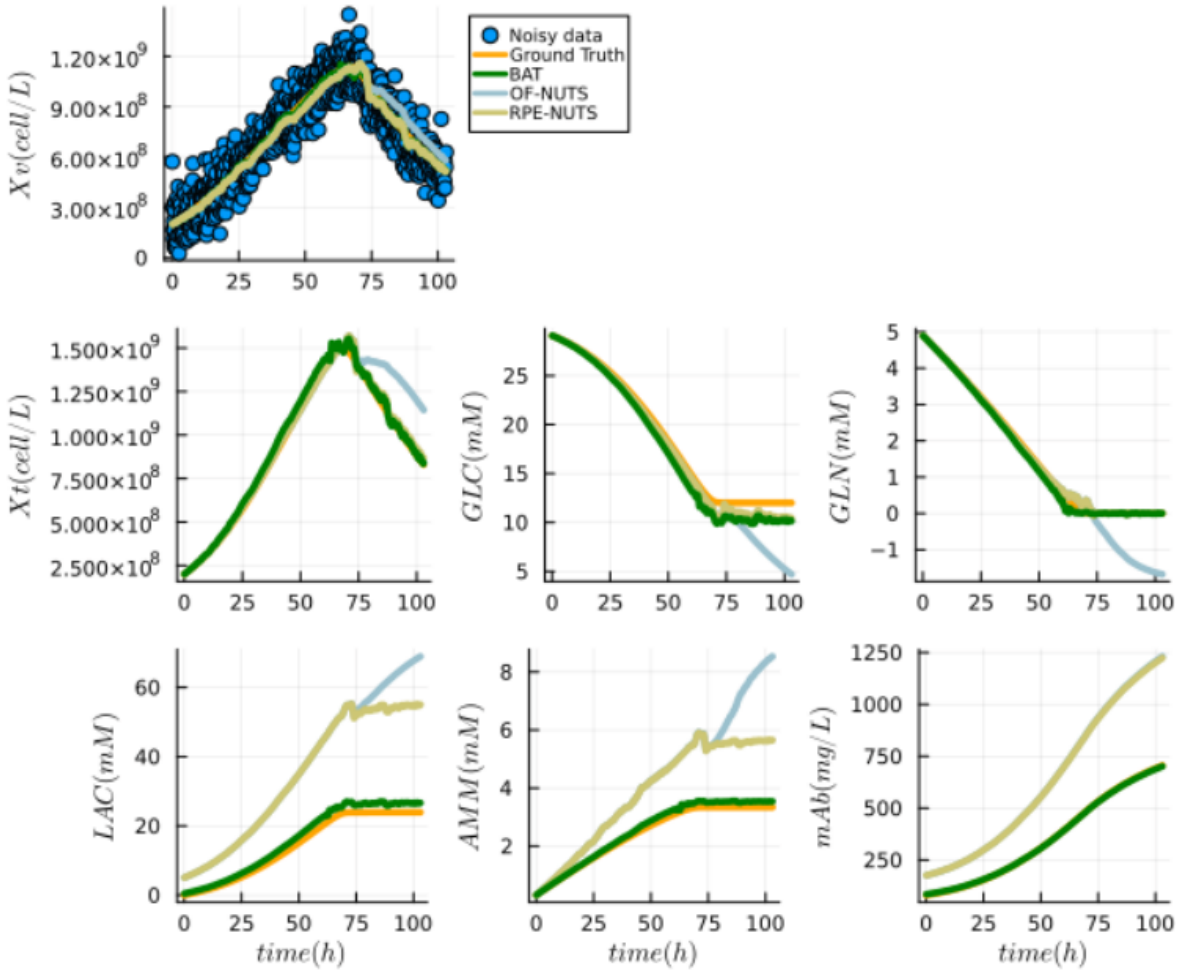

Figure 5. State variables estimations from EKF designed by BAT, OF-NUTS and RPE-NUTS during task 2 using the noisy Xv data of testing set B3.