The authors generally addressed the concerns of the reviewers (I am referring here mostly to the concerns expressed by myself, Anonymous Reviewer 1) and the resulting paper represent an improvement of the previous version.

Nevertheless, there are still some points to discuss:

1. There are still some imprecisions in the naming of the characteristics of the sinusoidal functions. In the equation $y = a\sin(bx + c)$, a represent the amplitude, b the frequency, and c the phase. The period T can be calculated using the equation $T = 2\pi/b$. Please keep it in mind and check carefully the paper before submission since there are still some imprecision (e.g. line 523)
2. Since $\theta_1 = \alpha + \beta\sin(\omega t)$ the combination expressed in line 224 $\alpha = \beta = \omega = 0$ produces $\theta_1 = 0$ for any value of t. I am still convinced that, since θ_1 represent a storage in the model, setting it equal to 0 it is not a good choice. I think that the right values to express what you mean are $\beta = 0$, $\alpha = \text{const}$ and the value of ω becomes irrelevant
3. I still have some doubts on the value of the parameter ω: as you write in the paper, your sinusoidal function oscillates with a period around 40 days: I think that the objective of using time varying parameters was to capture seasonality effects (e.g. high storage in winter and low in summer); is it what you want to represent with your model? If yes, I would expect the period to be around 365 days and not 10 times less
4. Line 261: it would be beneficial to list what are the “unknown quantities”

I think that overall the paper has made one step further towards publication. The only mayor concern that I have against it is verifying if the model is doing what it was meant to (see point 3).