The Authors want to take this opportunity to thank the reviewer for their time and their help in improving the manuscript.

Reviewer's 2 Comments

> *(1) I believe that it would be worth mentioning the following tangential point. Another scenario where the overall approach described can be beneficial is for the creation of Nature Run (NR) simulations used for OSSEs. These will generally be much higher in resolution than climate simulations, and therefore allow for an even higher compression ratio. Further, practical limitations generally limit NR output to infrequent snapshots, whereas there is great research value in sampling at the model time step. However, to be practical, producing in-situ data in this configuration will generally require online processing to avoid the costly intermediate step of dumping full states to disk as the first step in the processing workflow. OTOH, online processing would allow for improved scalability of the interpolation step. It would be nice if future versions of VISION would allow for an online distributed interface for such scenarios.*

We agree with the reviewer that the VISION toolkit (including the new Satellite_simulator which is currently under development) could be of great benefit in a higher resolution Nature Run (NR) for Observing System Simulation Experiments (OSSEs). If properly integrated into the model's workflow, the in-situ and Satellite simulators from the VISION toolkit would allow full sampling of the NR simulation at the model timestep and it would achieve an even higher data compression ratio compared to its use with climate models. As part of the NERC-TWINE project that partly funds the further development of VISION, we are planning on simpler code (in the form of Python libraries) which will be easier to interface with a variety of different models and we also aim to provide training material and workshops to help users integrate these tools into their own model workflow.

To highlight the possible future application of VISION to the OSSEs problem, we have added the following sentence on page 3 line 71:

"Another possible application of the VISION toolkit is for improving model comparison with observations when conducting Observing System Simulation Experiments (OSSEs) (Zeng et al., 2020). These experiments are typically performed using models with a high spatial and time resolution; integrating the VISION tools into the workflow of such high resolution Nature Runs (NR) would allow to efficiently sample data at the model timestep with much reduced data storage requirements."

> *(2) To a limited degree a similar approach has been used for field campaigns. E.g., https://github.com/GEOS-ESM/GMAOpyobs/blob/develop/src/pyobs/sampler.py*

The interpolation of data for better comparison of model and observations is not new, as evidenced in the introduction (line 53-56 and references therein). The VISION toolkit is relatively fast to run (takes less than 5 minutes to process 1 month of hourly model data) and can be automated to process large volumes of data at once, allowing for efficient data analysis over a large number of years.