

## ***Interactive comment on “Improvements to the use of the Trajectory-Adaptive Multilevel Sampling algorithm for the study of rare events” by Pascal Wang et al.***

### **Anonymous Referee #1**

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Review of the manuscript “Improvements to the use of the Trajectory-Adaptive Multilevel Sampling algorithm for the study of rare events”.

General comments: The authors conduct their research in a modern and poorly studied field, which is the finite noise induced transition in multi-stable, high-dimensional, non-gradient dynamical systems. The authors are very precise and explicit in defining objectives of the research, in structuring the manuscript and in exposing the obtained results. All sections are clear and well structured. The operation, benefits and limitations of the improved TAMS method has been demonstrated in two typical problems, one of which is two-dimensional double-well system and the other is a box model of

C1

the Atlantic Meridional Ocean Circulation (AMOC).

Specific comments: However, I have a suggestion to make. Due to the complexity of the model in example 2, it was not possible to estimate the typical transition path from the trajectory histograms of the system. Since this technique is one of the main results of the manuscript, it would be beneficial to give another example for multi-stable, high-dimensional, non-gradient dynamical system perturbed by finite noise whose characteristics will allow the application of the method developed.

Please also note the supplement to this comment:

<https://npg.copernicus.org/preprints/npg-2020-35/npg-2020-35-RC1-supplement.pdf>

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Interactive comment on Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2020-35>, 2020.

C2