1. PROJECT

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Title: Diffusion Models of Earth’s Outer Radiation Belt Using Stochastic Parameterizations

This dataset was supported by the Engineering and Physical Sciences Research Council (EPSRC) grant EP/L016613/1. This grant reference is for a PhD funded by EPSRC through the Mathematics of Planet Earth CDT at the University of Reading.

2. DATASET

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Title: Accounting for variability in ULF wave radial diffusion models – numerical experiment results

Description: This dataset contains results of the numerical experiments described in R. L. Thompson, C. E. J. Watt and P. D. Williams, ‘Accounting for variability in ULF wave radial diffusion models’, JGR: Space Physics, doi: 10.1029/2019JA027254.

Each file corresponds to an individual experiment in the study, containing the final phase space density (PSD) profiles of each ensemble member at the end of the experiment.

Publication Year: 2020

Creators: Rhys L Thompson

Organisations: University of Reading

Rights-holders: Rhys L Thompson

3. TERMS OF USE

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4. CONTENTS

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File names are listed as experiment\_\*\*\*\*.h5, and include dataframes containing the final PSD profiles of each ensemble member (column) over associated scales of variability (row) described in each experiment \*\*\*\*. The resulting deterministic PSD for comparison is also included in the final row, first column.

Each dataset corresponds to the following figures in the manuscript:

* experiment\_temporal.h5: Figure 3
* experiment\_spatial.h5: Figure 4
* experiment\_variances.h5: Figure 5
* experiment\_distributions.h5: Figure 6

Any language capable of reading hdf files should be able to render data files.

5. METHOD and PROCESSING

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Data was generated in Python 3.6, with detailed descriptions of each experiment setup available in the following manuscript and associated supplementary material:

Thompson et al. (2020), ‘Accounting for variability in ULF wave radial diffusion models’, Journal of Geophysical Research: Space Physics, doi: 10.1029/2019JA027254.