

Greg Lucas

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Technical Skills

Expert: Python (scikit-learn, pandas, numpy, dask, xarray), Linux, Fortran, version control

Intermediate: MPI, C, Java

Experience

Mendenhall Postdoctoral Fellow, United States Geological Survey 2017 - Present

- Developed an open source software package (github.com/greglucas/bezpy) to process and analyze data from geomagnetic and geoelectric communities.
- Utilized the software package to calculate realistic voltages across power transmission lines in the US induced by solar storms.

Graduate Research Assistant, University of Colorado 2012 - 2017

- Used machine learning techniques to analyze 4TB of data from an array of 31 instruments to identify unique signals within the data.
- Created the first physics-based model of the global electric circuit that will be included as a default module in future global climate models.

Member of the Technical Staff, Sandia National Laboratories 2009 - 2013

- Designed a new monte carlo code suite for statistical consequence analysis to determine the risk associated with launching nuclear material into space.
- Parallelized previous Fortran codes with MPI to enable 1000s of more runs to be completed and reduce the error in the analysis.
- Recognized by a review panel for innovative approaches to risk analysis.

Education

PhD Aerospace Engineering Sciences, University of Colorado 2017
Investigating the physical mechanisms that impact electric fields in the atmosphere

MS Medical Physics, University of Wisconsin 2010

BS Nuclear Engineering, University of Wisconsin 2010

Minor Computer Science, University of Wisconsin 2009

Selected Publications

Love, J. J., Lucas, G. M., Kelbert, A., & Bedrosian, P. A. (2018). Geoelectric hazard maps for the Mid-Atlantic United States: 100 year extreme values and the 1989 magnetic storm. Geophysical Research Letters, 44, doi:10.1002/2017GL076042.

Lucas, G. M., J. P. Thayer, and W. Deierling (2017), Statistical analysis of spatial and temporal variations in atmospheric electric fields from a regional array of field mills, J. Geophys. Res. Atmos., 122, 1158–1174, doi:10.1002/2016JD025944.

Lucas, G. M., A. J. G. Baumgaertner, and J. P. Thayer (2015), A global electric circuit model within a community climate model, J. Geophys. Res. Atmos., 120, 12,054–12,066, doi:10.1002/2015JD023562.