

## National Aeronautics and Space Administration (nasa.gov): NASA Heliophysics Science Division - Research Opportunities in Space and Earth Science (ROSES)

### Data products to be produced including Observational Data, Event Lists, and Simulation Output

For each data product, provide: (a) a short description of the product; (b) the scientific importance of the product (one sentence); (c) the type of data (e.g., time series, spectrograms, images); (d) estimated data volume; (e) planned documentation, e.g., for methodology and algorithms used; (f) expected delivery time, in project years; and (g) the archive you plan to work with, namely one or more of the following: Space Physics Data Facility (SPDF), the Solar Data Analysis Center (SDAC), and the Community Coordinated Modeling Center (CCMC).

#### *Guidance:*

Data products include any and all event lists, model output, or data products based on other products and/or modeling that are needed to validate and reproduce the scientific conclusions of peer-reviewed articles. Data products based on observations shall be archived and registered at the SPDF for non-solar data or the SDAC for solar data according to accepted heliophysics protocols ([https://spdf.gsfc.nasa.gov/guidelines/archive\\_newdata\\_reqt.html](https://spdf.gsfc.nasa.gov/guidelines/archive_newdata_reqt.html)), including the use of standard data formats (CDF, FITS, NetCDF and the relevant heliophysics standards associated with these, or the heliophysics standard Event List format ([https://hpde.gsfc.nasa.gov/HPEvent\\_List\\_Specification.pdf](https://hpde.gsfc.nasa.gov/HPEvent_List_Specification.pdf), along with standard metadata (SPASE descriptions including parameters; see <http://spase-group.org>). Simulation output will be registered by the CCMC and shall conform to their requirements so that it is accessible and useable by a typical scientist. For simulation output, metadata regarding the model and model run(s) are required. Proposers should work with CCMC to produce model output readers and interpolators compatible with the CCMC Kamodo Open Source Project, <https://github.com/nasa/Kamodo>.

Data are assumed to be covered by the Creative Commons Zero license (<https://creativecommons.org/publicdomain/zero/1.0/>) unless another open license is asserted and justified. Researchers will collaborate with data curation scientists at the archives to develop data products suitable for long-term scientific use.

If the project would produce data that are exempted in the NASA Plan for Increasing Access to the Results of Scientific Research, or no data that are scientifically appropriate for public release, explain why. Data held by NASA Heliophysics archives (SPDF and SDAC) or simulation results at CCMC and used without further transformation are considered already available.

Supplemental data that are ancillary to the publication of research results are required by NASA and increasingly by journals to be publicly accessible in a long-term archive. Such supplemental data shall be preserved and given DOIs (possibly as a collection relevant to all entries in the article) through the use of [Zenodo](https://zenodo.org/) (<https://zenodo.org/>) or equivalent archives. Supplemental data include numerical values needed to produce the specific figures, maps, images, tables, and movies that are required for the presentation of arguments in a journal article or other publication. It is presumed that these will be produced in accordance with currently applicable NASA and journal policies. These are not considered to be “data products” from the standpoint of the DMP. If only this level of data is to be produced in the project, the project DMP should simply be a statement to that effect.

- [NASA-Funded Research Results: NASA Publications and DMP FAQs](#)
- [NASA-Funded Research Results: DMPs](#)
- [NASA Plan for Increasing Access to the Results of Scientific Research](#)
- [NASA Earth Science Data & Information Policy](#)

### Data reduction, scientific analysis, or modeling software (including model output readers and interpolators) to be produced

Describe the software expected to be produced for this proposal, including the purpose of the software, the language(s) to be used, the open source license expected, the plan for archiving and providing open access to the software, and expected documentation.

#### *Guidance:*

GitHub (<https://github.com/>) and Zenodo or equivalent tools and archives may be used for archiving and dissemination of software. Licenses should be permissive, allowing free reuse. The Apache License Version 2.0 (<https://www.apache.org/licenses/LICENSE-2.0>) is strongly recommended.

For models to be hosted by the CCMC see their model onboarding guide, [https://ccmc.gsfc.nasa.gov/models/model\\_on\\_board.php](https://ccmc.gsfc.nasa.gov/models/model_on_board.php). If software would be developed but not made available under a permissive license, explain why. All open-source projects on GitHub, Zenodo, or equivalent should contain documentation including but not limited to a README that is the instruction manual that explains to users why the project is useful, how to get started, and to how to build and use the software. Posting of software does not imply a requirement to maintain it. This document may be downloaded from the SARA web page at:

<https://science.nasa.gov/researchers/templates-heliophysic-division-appendix-b-roses-proposals>.

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### **Roles and responsibilities of team members for data management**

State which team member(s) would perform data archiving tasks and indicate what those tasks would be. If there are costs associated with data archiving, those must appear – with explanation – in the proposal budget.

*Guidance:*

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- [NASA Earth Science Data & Information Policy](#)
- [NASA PubSpace](#)
- [NASA's Open Data Portal](#)