

The Space Physics Data System – Cosmic and Heliospheric Nodes

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Abstract

The Space Physics Data System (SPDS) is a community-driven network of information sources, linked and interfaced by World Wide Web software. The SPDS coordinators are community representatives to the NASA Space Physics Division, who are soliciting additional Web nodes, trying to keep the nodes organized, and soliciting information/suggestions about older data in danger of loss. Here we present a guide to data in Cosmic and Heliospheric nodes of the SPDS. New contributions to this system are being solicited and some funds may be available to assist with their development.

1 Introduction

The space physics community and the NASA organization have created the SPDS as a realization of the desire to facilitate archiving and accessibility of space physics data. Its objective is to ensure that useful space physics data are not lost, and are as conveniently accessible to the entire community as possible. NASA has provided some funding and a management structure, but the effort is basically a volunteer effort, user driven. Data are provided primarily by means of the World Wide Web (WWW) from a number of nodes at institutions familiar with the data.

This poster paper and the associated workshop are intended to familiarize the scientists in the Cosmic and Heliospheric (C&H) discipline with the SPDS organization, the C&H data in the various existing nodes and planned additions to the SPDS ; to instruct scientists in the use of SPDS and WWW; to summarize our other activities and solicit feedback on all our activities and plans; and to advertise the availability of limited funding for data restoration and accessibility activities. The SPDS is a growing and dynamic structure and this material will become obsolete very rapidly. The best sources of information about the SPDS, the WWW, and the SPDS management are the SPDS Web pages themselves. The list of contacts in this paper will serve as a starting point for the technically uninitiated who have no simple access to the WWW.

2 Management

2.1 History

The SPDS history includes recommendations from the National Academy of Sciences Committee on Data Management, Archiving, and Computing (COD-MAC) and the Congressional General Accounting Office and a succession of SPDS Planning and Steering Committees which culminated in a concept document [1] and a workshop. The workshop took the concept document as a starting point and focussed community attention on the issues brought up

there. The workshop produced a report [2] which, among other things, recommended a management structure, which was implemented as described below. By the time of the first management meetings, the WWW had emerged as the obvious technology of choice for implementing and coordinating the SPDS.

2.2 Coordination Teams

The SPDS has a Project Scientist, R. McPherron of the University of California, Los Angeles; two Project Coordinators, R. McGuire and M. Teague, both of the Goddard Space Flight Center; and four Discipline Coordinators, T. Garrard for C&H; for Solar, R. Bogart of Stanford University; D. Winningham of the Southwest Research Institute, for ITM; and for Magnetospheric, D. Sibeck of the Johns Hopkins University Applied Physics Laboratory. This group forms the Coordinators Working Group that channels science community input to NASA on SPDS and other data-related issues, working through J. Willett of Space Physics Division Mission Operations and Data Analysis. Each of the four Discipline Coordinators has a Discipline Coordination Team (DCT) which is intended to facilitate communications with the Discipline Community. The C&H team includes John Cooper of Hughes/STX Corp and the NSSDC; Alan Cummings of the California Institute of Technology; Paul Gazis of the Ames Research Center, Thomas Garrard, T. Gregory Guzik of Louisiana State University, William Kurth of the University of Iowa; Alan Lazarus of the Massachusetts Institute of Technology; Ralph McNutt of the Johns Hopkins University Applied Physics Laboratory; Roger Pyle of the University of Chicago; and Charles W. Smith of the Bartol Research Institute. Douglas Hamilton and Frank McDonald of the University of Maryland; Robert McGuire; Tycho von Roseninge of the Goddard Space Flight Center; and Bruce Tsurutani of the California Institute of Technology Jet Propulsion Laboratory are closely associated with the team in an evolving structure. Any of these people should be viewed as a conduit for suggestions to the SPDS or information from or about the SPDS. They, as well as the staff of the NSSDC/SPDF facilities, can also be contacted for advice on technical problems such as how to get started with the World Wide Web.

2.3 Cosmic and Heliospheric Support Structure

The Space Physics Data Facility (SPDF), headed by R. McGuire, is a sibling organization to the NSSDC in the Space Science Data Operations Office. The SPDF is the home node for the SPDS and the only institutional facility currently available to the C&H community. The SPDS home page [3] lives in this facility and points to pages for each of the four disciplines. These pages list nodes within that discipline. Each node, of course, has the possibility of pointing to still more nodes.

NASA has made a modest amount of funding available to the Discipline Coordinators for travel, communications, and other support activities associated with SPDS. The C&H DCT is contemplating the use of the bulk of this funding to share costs on a Caltech owned computer system which would then serve as a home node for the C&H discipline. This C&H node would to some extent duplicate the pages at SPDF, but could add flexibility to the system.

In particular, we are looking at the idea of maintaining a mail exploder which would make it straightforward to address email to the entire C&H community. Useful adjuncts of such an exploder include a bulletin board and a newsletter.

3 The Data and the Structure of SPDS

3.1 Existing Nodes

As of this writing, the C&H page [3] has pointers to neutron monitor data at the University of Chicago; IMP, Voyager, and WIND plasma data at MIT; particle data from all four SAMPEX experiments furnished by the University of Maryland and co-investigators; cosmic ray particle data from the Voyager Cosmic Ray Science team; a variety of particle, field, and plasma wave data in the Planetary Data System, and IMP8 and ISEE3 solar wind and magnetic field data at UCLA.

3.2 Planned Nodes

The DCT has recommended funding restoration of Helios plasma wave data, which will eventually turn up on the Web. We are cognizant of the recent funding of LSU to support a node containing cross section data for nuclear interactions. This node will be 'entirely' funded by SPDS and so might be another possibility for the C&H home page/node discussed in section 2.3. The Pioneer plasma data at Ames Research Center should be on line by the time of the ICRC. We are also working to bring the Mt. Washington neutron monitor data into the SPDS.

Among planned nodes, the ACE Science Center has been planned since its relatively recent inception as a node of the SPDS. ACE will supply a 'browse parameter' file with data from each of the nine instruments, with a very short delivery time (< 10 days goal). The Science Team is also soliciting collaborations with other missions and plans to include data from other missions in the browse file.

In regards to funding from SPDS, we currently give preference in our recommendations to data restoration proposals as suggested by the workshop. The priorities for that process have been guided by a Data Evaluation Report [4], prepared by a separate panel which predates the workshop and the current structure. We are still in the process of updating and enlarging that report. There have not been as many proposals as we hoped, and one objective of this paper is to seek additional proposals and/or advice on data restoration. The other disciplines are moving toward a consensus that restoration is adequately completed and accessibility should be the highest priority. C&H is clearly behind the other disciplines and we are anxious to hear suggestions/proposals from the community to rectify this situation.

3.3 SPDF/NSSDC/NMD

One question which comes up repeatedly in SPDS discussions is the extent to which SPDS is a redundant service, especially in view of recent improvements in services of NSSDC. Certainly any search for data should begin with a check of the NASA Master Directory (NMD). The advantages of the SPDS include oversight and support of the data by the expert team that took the data,

plurality, and flexibility. The SPDS also provides ready access to information, such as nuclear interaction cross sections and neutron monitor data, that is not normally archived by the NSSDC. The basically volunteer nature of the SPDS keeps the cost to a minimum.

Another open issue in relations between SPDS and NSSDC is the search for a techniques for guaranteeing that all SPDS data are eventually migrated to NSSDC for 'deep' archiving, since the institutional lifetime of these volunteer efforts is not guaranteed.

3.4 Cataloging and Searching

One disadvantage of the WWW in its present form is the lack of cataloguing information. In the absence of such information, it can be an adventure to find a particular datum. At present, the C&H SPDS system is sufficiently small that this lack is not a problem, but it may become important as the number of nodes increases. The Solar Discipline SPDS is implementing a keyword search to address this problem on their system and we will evaluate their results for C&H purposes. We also expect solutions to become available from the WWW, since the WWW is evolving rapidly, and this lack is an issue that affects its entire user community.

4 Other Issues

We have as a goal the sharing of techniques and computer codes as well as data. This goal, of course, conflicts with the same issues of proprietary rights that have slowed data sharing and will have to be approached carefully.

We will offer our opinion to NASA on a number of open issues including data interchange format standards, Discipline Data Management Plans, Project Data Management Plans, operation of NSSDC and NMD, etc.

5 Acknowledgements

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References

- [1] Concept Document on NASA's Space Physics Data System (1993).
- [2] Report of the Community-Wide Workshop on NASA's Space Physics Data System (1993)
- [3] The URL of the Space Physics Data System home page is <http://nssdca.gsfc.nasa.gov/spds/spds.html> .
- [4] McGuire R. E., Cooper J., Gazis P., Kurth W., Lazarus A., McDonald F., McNutt R., Pyle R., and Tsurutani B. Space Physics Cosmic & Heliospheric Data Evaluation Report (1995) ,