

Sharing of knowledge for collaborative analysis in the Solar-Terrestrial data Analysis and Reference System [STARS]

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Cross-sectional data analyses have become important for further understandings of Solar-Terrestrial Physics (STP) fields. There are variety types of observation target in STP fields, for example, the sun, solar wind, interplanetary magnetic field, the magnetosphere and the ionosphere of the earth. There are variety types of observation technique, for example, in-situ observations by spacecrafts, remote sensing by spacecrafts, and ground-based observations. It is hard for one researcher to be familiar with all of the observations. Usually, one researcher is a specialist in one or some types of observations and is not a specialist in the other observations. Therefore, cross-sectional data analyses require cooperative works by researchers whose own specialties are different from each other. If the knowledge and the experiences of each researcher are exchanged with each other, these exchanges boost to do collaborative analysis.

The Solar-Terrestrial data Analysis and Reference System (STARS) is a system, which realizes cross-over search and integrated analyses with combined plot of STP fields. The STARS has two special functions for cooperative works. One is Stars Project List (SPL). The other is event list database. Sharing of the SPL is useful for interactive information exchanges between researchers. The event list database provides users of the STARS crossover hints for recognizing typical STP phenomena.

Stars Project List (SPL)

After a user on the STARS downloads several types of data and makes a combined plot, the information about the downloading data and the information about plotting can be stored in an XML file. The XML file is called as Stars Project List (SPL). Because an SPL contains detailed information of a combined plot, not only the user who made the combined plot but also any other users can easily make the same plot without checking data file download options and plotting options. Further, any user can modify the combined plot by adding data file or by changing plotting options.

One of the interactive ways of sharing SPL in the collaborative analysis between researcher A and researcher B is as follows. (1) The researcher A downloads data AA which the researcher A is familiar with. (2) The researcher A makes a plot about data AA and saves SPL#1. (3) The researcher A sends SPL#1 to the researcher B. (4) The researcher B receives SPL#1. (5) The researcher B easily makes the same plot based on the information stored in the SPL#1 and views the plot. (6) The researcher B downloads data BB which the researcher B is familiar with. (7) The researcher B modifies the original plot by adding data BB to the original plot and saves SPL#2. (8) The researcher B sends SPL#2 to the researcher A. (9) These processes are repeated interactively until a final combined plot is completed.

Event list database

When one researcher finds an interesting variation of typical phenomena in the plot, then the researcher recognizes it as an event. The researcher can register the event in the event list database in the STARS. Each event is described in XML. Each XML file contains detailed information (title, start/end time, comment, name who registered the event etc.). When a variety of the researcher register the events based on their own specialties, the event list database becomes rich and covered fields increase. The event list database is, in some sense, 'accumulated knowledge of specialists'.

Any user of the STARS can know the events which have been already registered by other users as well as by oneself by using quick viewing tools. It means that the accumulated knowledge of specialists is 'shared' by all of the STARS users.

In collaborative analysis, event list database provides all participants crossover hints for recognizing typical occurrences of STP phenomena.

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