Further development and support of the web-based Data Retrieval and Plotting Engine (DARPE)

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We describe further improvement and new features of DARPE, a web-based system for searching the data in the NRDF format, retrieving information and plotting.

Introduction

The Data Retrieval and Plotting Engine (DARPE) has been developed since 2002 and made accessible for public use in summer 2003. It has been a useful tool for those who use the data collected and processed by JCPRG.

The JCPRG has begun compiling the Nuclear Reaction Data File (NRDF) database in 1974. The database now contains over 1800 entries with the experimental data obtained since 1960. The expansion of Internet in 1990s made it possible to develop web-based tools to search, extract and plot the data using conventional web browsers without any additional software. As a result, the Data Retrieval and Plotting Engine (DARPE) has been developed since 2002 and made accessible for public use in summer 2003.

Main Features

Below we briefly outline the main features of DARPE. More details can be found in: JCPRG Annual Report No. 16 (2002), pp. 39-50.

DARPE is located at the URL: http://www.jcprg.org/darpe/ (Fig. 1). A visitor can make a query using the following fields: *author*; *projectile*, *target*, *incident energy*, *quantity*, *author*, *reference* and *year*. One can form a query by direct input of some keywords or by selecting items from pull-down menus. The results of the search are shown after the “Search” button is pressed.

As the data in the NRDF format is classified in entries (normally, one paper in a journal) and data sets (data in an entry which can be stored in the form of a table), the query may be relevant to entries (the year of publication, author, etc.) or specific data sets (projectile, target, incident energy, quantity). Hence the results of the search are shown in the form of a list of entries and, if applicable, of separate data sets of each query (Fig. 2). This is done to underline the information that is the most relevant to the user’s current interest.

The data retrieved in a search can be plotted with a possibility of selecting data from different sets and entries.

Finally, the JCPRG staff uses DARPE for checking the NRDF data files for missing or improperly coded data in order to maintain the database.

New Functions and Possibilities

JCPRG has been responsible for support and improvement of DARPE since it was made public. While the core of the system has not been changed since 2002, some new features have been introduced.

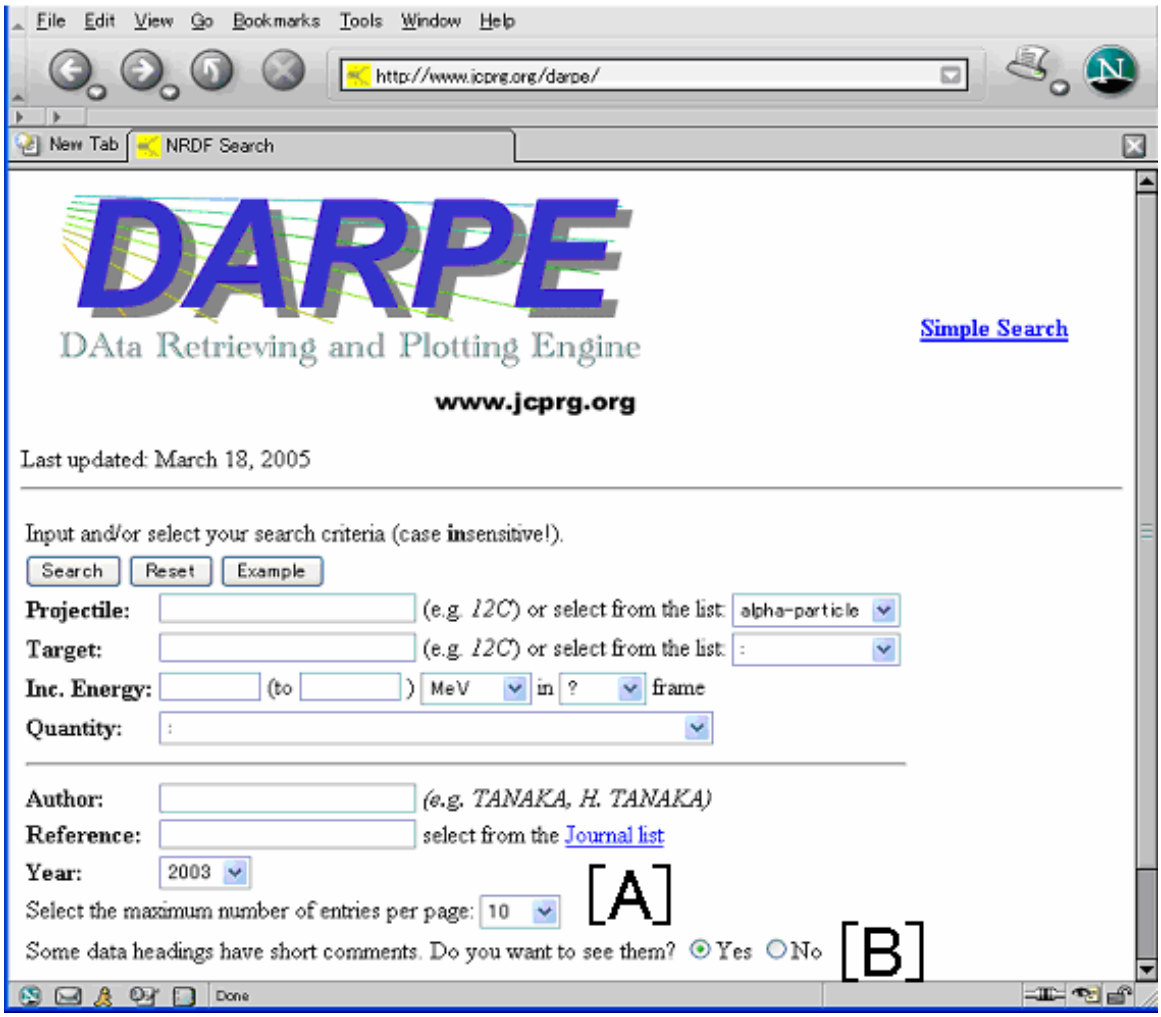

Fig. 1 Front page of DARPE

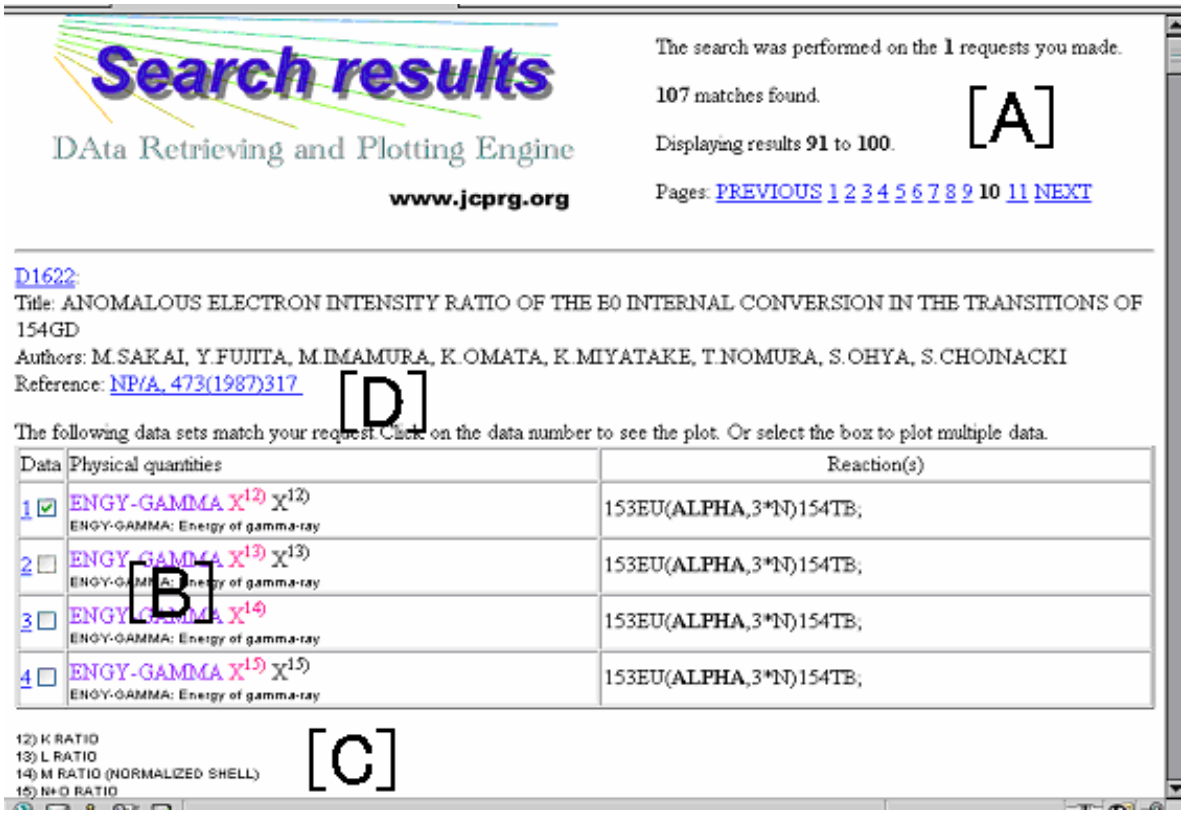

Fig. 2 Search results

- The headings for data tables are normally shown in an abbreviated form, like “INC-ENGY-LAB” or “THTC”. Although in some cases these keywords are easy to understand, in others they are not. To avoid any confusion, a brief explanation of each keyword is now shown for each data set (Fig. 2, [B])

- Apart from that, often data entries contain additional comments related to some of the physical values; it may be an extended explanation of the measured physical quantity, or even a definition of quantity for which there is no keyword (in such cases, the keyword “DATA” is used, and the comment is of key importance). These explanations are now shown as a footnote below the data table of a data entry (Fig. 2, [C]). This feature can be turned off at the front page, if the user wishes so (to get a concise output, etc.) (Fig. 1, [B]).

- The multi-page output is now available. By default, the results are shown in one or several HTML pages, with 10 data entries per page. On the top of each page, there is information on the number of requests the user made for the current search, the number of found matches (entries having data sets satisfying the search criteria), the numbers of the results displayed in the current page, and a navigation links to jump to the next, previous, or any given page with the results

of the current search (Fig. 2, [A]). The number of entries per page can be changed at the front page (Fig. 1, [A]), with a possibility that all entries are shown at a single page. The latter option is convenient when there is a need to select data from various entries for plotting.

- When the results of a search are shown, references to original papers are hyper-linked (Fig. 2, [D]). This hyper link is made for
  Phys. Rev., Phys. Rev. C and D, Phys. Rev. Lett., Nucl. Phys., Nucl. Phys. A, Phys. Lett. B, Euro. Phys. J. A, J. Phys. G, Nucl. Instrum. Meth. A and B, Prog. Theor. Phys., J. Phys. Soc. Jap., Appl. Rad. Isotope, Radiochem Acta., J. Radio. Nucl. Chem. and Z. Phys. A (if electric version is available).

- By default, the data in the first and second columns in a data set are plotted. The headings are shown in the results page in blue and red, respectively. However, at present any two columns can be plotted against each other. This applies to multiplexing data from several sets as well. The only condition is that the headings selected for the X- and Y-axes were the same in each data set. The necessary checking is done by an additional subroutine, which leads to one of the two pages:
  - if all data sets have several (at least two) columns of data with the same headings, the user is asked to select those of them, which will be plotted as the independent and dependent quantity (the X- and Y-axes);
  - if the data from several sets are incompatible to plot, an error message is generated.

  The flow of the process of plotting data is shown in Fig. 3.

- The process of making the data accessible to the public use involves coding the data, checking and refereeing. In many cases the data can be useful for the users even though final checks are not over. JCPRG decided to make such data accessible via DARPE with a flashing red “NEW” icon signaling that the data was not given the final approval, and some changes can still be made. The files with these data are stored separately as “new”, but otherwise they are treated in the same way as the approved files. In the situations when the same file is stored both as “new” and “approved”, the second status has a priority and the sign is not shown.

Access analysis

Since DARPE was made open to public in 2003, its front page has been accessed over 2,000 times (data on March 2005). Apart from Japan, there have been visitors from (in the backward order of access count) USA, Turkey, France, Belgium, Russia, Germany, Ukraine, Italy, Canada, Romania, U.K., Switzerland, Argentina, Portugal, Israel, South Korea, Thailand, Denmark, Spain, Finland, Hungary, India, Myanmar, Saudi Arabia, and Norway. As for Japan, there have been visits from universities of Hokkaido, Kyushu, Tohoku, Kyoto, Nagoya, Osaka, Niigata, Konan University and others, as well as from research organizations like JAERI and RIKEN. Hence we can say that DARPE

has been tested throughout the country and abroad. However, there is a potential for a more extensive use: typical number of hits per day is between 5 and 10.

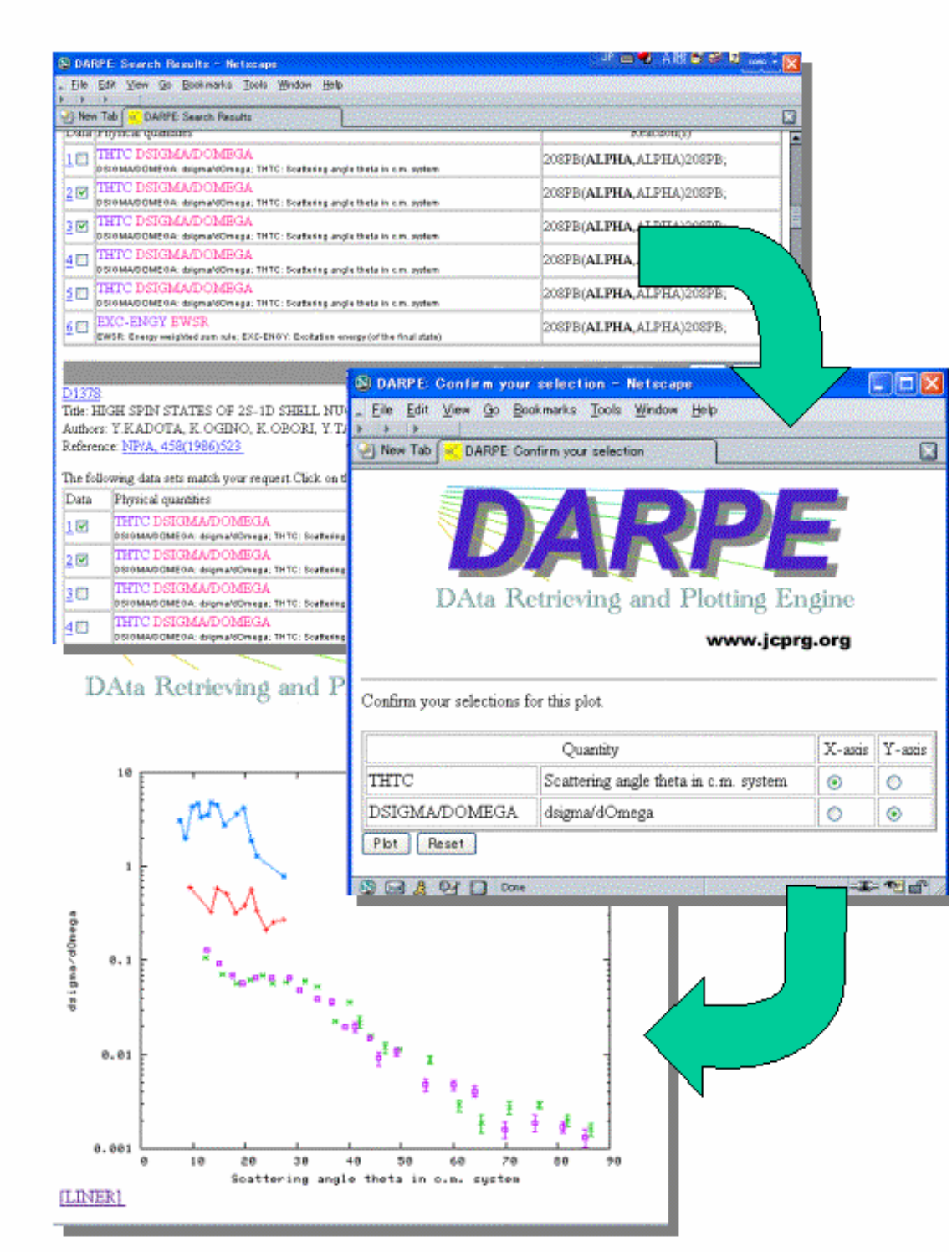

Fig. 3 Plotting data