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A bibliography for heavy ion inertial fusion

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Abstract

There appears to be no large technical database which includes all the journals and publications appropriate to heavy ion fusion (HIF). We have started compiling an HIF bibliography database as an ongoing, part-time activity. The database currently has 630 references, mostly from HIF symposia and accelerator conferences. Each reference is given a primary keyword from a list of eigth topics and a secondary keyword from a list of 16. Conventional desktop software allows sorting, searching and extracting. The software, methods, keywords and current category totals are described.

1. Introduction

It has been 19 years since the first HIF workshop. HIF has been recognized as the method of choice for inertial fusion energy for several years. There are over 500 technical articles in proceedings of workshops, symposia and conferences. In addition to these papers there are a large number of other articles and technical reports in a variety of journals and books on the subject. A bibliography should be useful for interested observers and for future reviews as well as for HIF scientists.

A few large, national and international databases exists. An example is QSPIRES at SLAC, in collobaration with DESY and LBNL. The basic problem with these databases is that they do not include the wide variety of publications and journals necessary for HIF. Our survey, albeit limited, indicates that no database exists which includes more than 10%–20% of HIF-related papers.

This work is a part-time, ongoing effort. Currently the database has 630 references, mostly from HIF symposia and accelerator conferences.

2. Database software

The database is being developed in three desktop computer formats:

LOTUS 1-2-3 for the PC; FILEMAKER PRO for WINDOWS; and FILEMAKER PRO for the Macintosh. These programs are readily available at low cost. The LOTUS 1-2-3 program includes macros for sorting, searching, querying, printing and generating ASCII files. These same functions are provided naturally in FILEMAKER PRO. The LOTUS program was chosen because it is widely used and because it can be used in DOS as well as WINDOWS operating systems. FILEMAKER PRO was chosen because of its unique, simple conversion between the DOS and Macintosh formats. It is also a versatile database program useful for other applications. Data are entered in the LOTUS program and then imported into FILEMAKER PRO.

Each reference (or 'record') is given a basic abbreviation (ABBREV) consisting of the first three letters of the last name of the first author, the first letter of his/her first name, the two-digit year

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and an additional a, b, ... in case of more than one reference in the year. For example, MasA75 is Al Maschke's 1975 pioneering paper. In rare conflicts (e.g. J. Lindl and J. Linhart) the first four letters of the last name are used. This use of an abbreviation eliminates the need for an arbitrary numbering system, while keeping the primary tag compact and easily understood.

Each record has four other basic fields: TITLE, JOURNAL, AUTHORS and NAME—the last name of the first author. Three other fields are the year (YR); a single letter for type (A = abstract, B = book/chapter, C = conference proceedings, P = preprint, J = refereed journal or R = report); and NOTES. Finally, we assign each reference a TOPIC and SUBTOPIC from the list below. The total is 13 fields, counting an extra field for long titles and two extra fields for long author lists.

3. Topics and subtopics

The topics with their current subtopics in parentheses are as follows:

- Accelerators (Induction, Injectors, Recirculators, RF, RFQ, Rings);
- Atomic Physics;
- Beams (Chamber, Experiments, Theory);
- Reactors;
- Reviews (Government, Laboratories, Induction, RF, Injectors);
- Systems (Design, Economics, Induction, RF, Recirculators);
- Targets (Design, Interactions);
- Other (Laser, Light-Ions).

These topics and subtopics are assigned according to the primary thrust of the reference. Laser and light ion references are included only in so far as they are in HIF symposia or have direct relevance to HIF. For many references a subtopic is not appropriate, in which case the word 'none' is used to remove doubt. The list above includes subtopics assigned to data. As more records are added, a given topic may be expanded to include additional subtopics.

The user can query, sort or search on any combination of the 10 basic fields. In addition, a WINDOWS user can use copy and paste techniques to include references in his/her own publications. At this writing, text help is included in 1-2-3 but not yet in FILEMAKER PRO. However, FILEMAKER PRO has considerable built-in help.

The largest categories to date are as follows: Beams–Theory (85); Targets–Design (55); Beams–Chamber (50); Accelerators–Injectors (47); Targets–Interactions (43); Reviews–none (36); Beams–Experiments (28); Accelerations–Induction (25); Reviews–Laboratories (23); Other–none (21); Accelerators–RFQ (21); and Atomic Physics–none (18). These numbers are influenced by the fact that little effort has so far been expended to search journals beyond the symposia and accelerator conferences.

Print-outs with different formats are possible. Currently, the primary print-out is arranged for the maximum number of records per page. The format is as follows: the first line is used for ABBREV, TYPE, TOPIC, SUBTOPIC and JOURNAL; the second line has the TITLE; and the third line has AUTHORS. The TITLE is automatically expanded to two lines and AUTHORS up to three lines as necessary. A sample in this format using the Maschke reference is thus:

MasA75 C Systems Design IEEE Trans. Nucl. Sci. NS-22, 1825 (1975)
Relativistic Heavy Ions for Fusion Applications
A.W. Maschke

It is our hope that a carefully implemented bibliography for heavy ion inertial fusion will be a timely and useful addition to this important international program. Input to the bibliography and suggestions are hereby solicited from the major laboratories. Contact the author with e-mail at TGODLOVE@GMU.EDU or at FM Technologies, 10529-B Braddock Road, Fairfax, VA 22032. The method of distribution has not been decided; various options are being considered.

4. Trademarks

The software referred to is as follows: LOTUS 1-2-3, from Lotus Development Corp., Cambridge, MA 02142; FILEMAKER PRO, from Claris Corp., Santa Clara, CA 95052; and WINDOWS, from Microsoft Corp., Richmond, WA 98052. Macintosh is a registered trademark of Apple Computer, Inc.