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Establishment of new database engine for experimental-charge-exchange-collision cross-sections

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A new database engine, which provides experimental-charge-exchange-collision cross-sections through SQL queries free of charge, has been established. It provides an electric version of cross-section data compilation for ion-atom and ion-molecule collisions, done under the collaboration of the Japan Atomic Energy Agency (JAEA) and our laboratory since 1983. [1,2]

Data stored in the database are total electron capture and loss cross-sections published since 1983 and partial cross-sections since 1992, compiled from journals of our selection. Experimental cross-sections for some related interactions since 1995, like inner-shell ionization of target, ion-ion collisions, cluster collisions and so on, are also compiled and stored. These compilations have been done without limiting the projectile ion or target species of the collision system, aiming at larger area of applications as well as fusion research.

The database is consisted of 8 tables, COL, DATA, DOC, REF, AUTH, AFF, MAT and PROC. The collected papers are indexed by document number key ”docno” and the data are indexed by a combination of document and collision system number keys “docno, sysno”, for cases that single paper includes multiple collision systems. The most important 3 tables COL, DATA and DOC store collision system information, numeric data and bibliographic indexes, respectively. In case that cross-section data for some collision system are required, “docno, sysno” keys for the desired system should be looked up in the table COL, and the numeric data are derived from the table DATA using those “docno, sysno” keys. If the bibliographic information is additionally required, it can be looked up in the DOC table with the “docno” key. Reference with specifying the known paper’s information is also possible by looking the “docno” key up in the table DOC and look into COL and DATA tables.

In the present, the database query is available only through SQL queries and user-friendly interface is not provided, but we continue establishing http-based user-interfaces.

[1] IMAI Makoto *et al.*, J.Plasma Fusion Res. SERIES, Vol.7 (2006) 323.
[2] KUBO Hirotaka *et al.*, J.Plasma Fusion Res. SERIES, Vol.7 (2006) 352.