

XIII. DESCRIPTION OF THE COMPUTER CODE SAMMY

The computer code SAMMY was originally developed to run efficiently on the DECSystem-10 (PDP-10) at the Oak Ridge Electron Linear Accelerator (ORELA). Because memory rather than CPU time was the limiting factor on the PDP10, a number of techniques were used to conserve memory, occasionally at the expense of run time. These techniques include dynamic allocation of array storage (Section XIII.A), use of temporary data files to store intermediate results (Section XIII.B), and division of the program into substantially independent segments (Section XIII.C).

In 1985 ORELA replaced its PDP10 with a VAX785, and SAMMY migrated to the system. Since the mid 1990's, the primarily operating system for SAMMY development has been UNIX or LINUX. Currently the author maintains the code under UNIX (f77 on IBM and VAX-Alpha workstations) and LINUX operating systems; the same version also works on Windows under Compaq FORTRAN. Portability to VMS operating systems is no longer maintained.

Prior to release M5 of the code in 2000, the “division of the program into substantially independent segments” was significantly altered; see Section XIII.C for details. Future plans call for continued modernization of the coding, including conversion to FORTRAN 90; this will eliminate the rather archaic (but nevertheless useful) “dynamic allocation of array storage” currently in use (Section XIII.B).

For the 2006 release 7.0.0 of SAMMY, the use of temporary data files has been significantly lessened but not yet completely eliminated.

For the benefit of persons wishing to port SAMMY to a new computer system, a brief discussion is included in Section XIII.D regarding routines and statements specific to a given computer. The discussion is not expected to cover all conversion problems but merely to point out a few problems of which the author is aware.

The ODF (ORELA Data Format) plotting package in use at Oak Ridge is not easily portable to most machines. See Section XIII.E for a discussion of this topic, and Section X.I for a discussion of alternatives.

In 2005 a modern configuration and distribution system was designed by ORNL researcher Dorothea Wiarda. This system, described in Section XIII.F, makes it significantly simpler for a user to install SAMMY.