

X.H. SAMORT: PLOT THE OAK RIDGE RESOLUTION FUNCTION

When using the realistic resolution function (see Section III.C.2), it may be useful to plot both the individual components of the resolution function and the final composite function. This can be accomplished using program SAMORT, which requires only the PARAmeter file and three other numbers (energy, mass, and flight-path length) as input. Output consists of one ASCII file, as many as five plot (ODF) files, five “generic” plot files, and five additional ASCII files. The first ASCII file gives details of the case being run, including for example centroids for each component of the resolution function. Four plot files give time vs. resolution function for each component, and the fifth gives energy, resolution function, and time for the composite function (so that one can plot the resolution as a function of either energy or time). As with other plot files produced by SAMMY, these are in ODF format. For the benefit of SAMMY users who do not have the ORNL plotting package FORODF, the same information in the ODF files is also given in ASCII files with extension “LST”, and in “generic” binary files with extension “PLT”.¹

A sample interactive (Unix) run of program SAMORT is accomplished with the following lines of input:

```
samort
a.par
180000.,57.935,201.578
```

Here the energy at which the functions are to be evaluated is 180000 eV, the mass of the sample is 57.935 amu, and the flight-path length is 201.578 m.

The file a.par can be either the complete PARAmeter file or may contain only the ORRES portion thereof. The file may look similar to the following (see test case tr021, file t021tlo.par):

BURST	1	1.775	.5		
TANTA	1	0.200	0.1		
TANTA	1111	0.010	0.050	0.090	0.040
TANTA		0.005	.005	0.005	0.005
TANTA	11	0.079	1.000		
TANTA		0.04	0.5		
LITHI	111	5.000	0.392235	1.009	
LITHI		2.000	0.200000	0.500	
CHANN	1	200000.000	7.179	4.000	

(See card set 9 of the PARAmeter file, Table VI B.2, for interpretation of these numbers.)

¹ Prior to version 7.1.5 of the SAMMY code, the “PLT” extension was used to denote the ASCII files produced by program SAMORT. The change from “PLT” to “LST” for the ASCII files and the addition of “PLT” binary files were made to conform with usage elsewhere in the SAMMY code. (See, for example, Section VII.C.)

Output plot files are as follows: The file SAM_ORR.ODF contains energies in section 1, resolution function in section 2, and time of flight in section 3. File SAM_ORR_BURST.ODF contains time of flight in section 1, and the burst-width component of the resolution function in section 2. File SAM_ORR_TANTA.ODF contains time in section 1 and the tantalum target component of the resolution function in section 2. File SAM_ORR_CHANN.ODF contains time in section 1 and channel-width component in section 2. Finally, the file SAM_ORR_LITHI.ODF contains time in section 1 and the Lithium-glass detector resolution function in section 2.

If the water moderator or the NE110 detector had been used instead, the respective file names would be SAM_ORR_WATER.ODF and SAM_ORR_NE110.ODF.

For a description of the contents of the ASCII LST files, substitute “column” for “section” in the above description. The one exception to that is file SAM_ORR.LST, for which column 1 contains time of flight, column 2 the resolution function, and column 3 energy.

What follows is the output ASCII file SAMMY.ODR produced by running the example described above:

```
p -----
      1.7750E-03
a, w, x1, x2, x3, x0, alpha --
      1174.      463.6      1.7041E-06  8.5204E-06  1.5337E-05
      6.8163E-06  1.000
c -----
      7.1790E-03
d, f, g -----
      5.0000E-03  392.2      1.009

<t>, t1, t2, t3, t4 -----
      1.0224E-02  8.8750E-04  1.5522E-03  3.5895E-03  4.1951E-03
tlow, time, tup -----
      34.252758      34.350628      34.360852
eup , em , elow -----
      181030.09      180000.00      179892.89
#####
```