

X.F. SAMDIS: STATISTICAL DISTRIBUTIONS

The code SAMDIS is a slightly modified version of the code SAMDIST [LL95], which is used to verify the consistency of a resonance parameter set with the predicted theoretical statistical distribution. Three different tests can be performed:

1. Level spacing distributions are compared with the Wigner distribution law.
2. Neutron-, radiation-, and fission-width distributions are calculated and compared with the χ^2 distribution with the appropriate number of degrees of freedom ($\nu = 1$ for the Porter-Thomas distribution of neutron widths, $\nu = 2$ or 3 for fission, and $\nu = \text{infinity}$ for capture widths).
3. Long-range correlations of the energies are tested via the Δ_3 statistic of Mehta and Dyson.

Details of the three tests are given in the SAMDIST manual.

One modification to the code (and to the input; see Table XF.1) has been made subsequent to the publication of the SAMDIST manual: The calculation of distribution of neutron widths now includes penetrabilities. Hence it is necessary to define the orbital angular momentum and to give the atomic mass of the target nucleus.

Table X F.1. Input for program SAMDIS

Line number	SAMDIST prompt	Response	Notes
1	Type d (for spacing), w (for width), or d3 (for delta3)	“d”, “w”, or “d3”	Line 3 appears only for “w” in line 1
2	Parameter file name	name of file	30 characters or less
3 (“w” only)	Enter particle channel	“neutron”, “fission”, or “gamma”	only lowercase is permitted; note also that this line appears only for type 2 (“w” in line 1)
4	Spin group, initial and final energies	SAMMY spin group number, Emin and Emax	free format, separate by commas
5 (“w” and “neutron” only)	Enter <i>l</i> and awr	integer value of orbital angular momentum, mass of target nucleus	This line is absent unless line 1 is “w” and line 3 is “neutron”
6 (“d” or “w” only)	Bin width for sampling	in units of energy	This line is absent for “d3”
7 (“w” only)	Degrees of freedom	degrees of freedom for chi-squared distribution	This line is here for “w” only (not for “d” or “d3”)