

## **X.P. SUGGEL: ESTIMATING $L$ AND $J$**

Often when beginning an analysis, the SAMMY user will start from spin assignments and resonance parameters already available in the literature or in the ENDF files. Sometimes, however, such information is either nonexistent, inadequate, or unavailable through the entire energy range. In such situations, the analyst must use alternative methods to obtain starting parameter values.

The computer program SUGGEL [SO01], written by S. Y. Oh and L. C. Leal, provides one such method. The following description is taken from the abstract to that document:

“The SUGGEL computer code has been developed to suggest a value for the orbital angular momentum of a neutron resonance that is consistent with the magnitude of its neutron width. The suggestion is based on the probability that a resonance having a certain value of  $g\Gamma_n$  is an  $l$ -wave resonance. The probability is calculated by using Bayes’ theorem on the conditional probability. The probability density functions (pdf’s) of  $g\Gamma_n$  for up to d-wave ( $l = 2$ ) have been derived from the  $\chi^2$  distribution of Porter and Thomas. The pdf’s take two possible channel spins into account.”

“This code is a tool which evaluators will use to construct resonance parameters and help to assign resonance spin. The use of this tool is expected to reduce time and effort in the evaluation procedure, since the number of repeated runs of the fitting code (e.g., SAMMY) may be reduced.”

SAMMY test case tr141 gives three examples of SUGGEL runs.

Readers are referred to the documentation [SO01] for details concerning the use of this code. That document’s description of the input to the code is repeated here (below the line, and in Table X P.1). Note that the second of the two input files is the resonance-parameter portion of a SAMMY-style PARAmeter file, and the name for this file is provided in the suggel.inp file discussed below.

The program requires two input files and generates two output files. The basic data, as well as some control options, for the calculation are included in a file named “suggel.inp”, while sets of resonance energy and neutron width are provided in the other input file. One of the output files shows calculation results, and the other file contains resonance parameters in SAMMY.PAR format.

### Input Description

The file “suggel.inp” is prepared in the name-list type of input. This file consists of:

The first line: “&indata” from column 2 to 8,

In the second to the (last-1) lines: data section with the name-list key words (each line shall have the first column blank), and

The last line: “&end” from column 2 to 5. Some notes can be added after this line for user’s convenience.