

III.C.3.b. Input for the RPI/GELINA/nTOF resolution function

Input formats for all parameters of the RPI/GELINA/nTOF resolution function are given in Table VI B.2, card set 14. Note that zero values are assumed to actually be zero and are not replaced by default values. The first line of this card set contains one of the following phrases (which are treated as equivalent):

```
RPI Resolution function
GELINa resolution function
NTOF resolution function
```

As usual, only those characters in capital letters are required; those in lower case letters are optional.

In Table III C3 b.1, default values for the constants from Eqs. (III C3 a.2) through (III C3 a.5) are defined for transmission and capture measurements. To invoke these defaults (without the option to flag them for varying), the user must specify the appropriate phrase

```
RPI Transmission resolution function or
RPI Capture resolution function
```

on the first line of card set 14.

Table III C3 b.2, provided courtesy of Frank Gunsing of Saclay [FG05], gives parameter values that may be suitable for use with data from the Geel Electron Linear Accelerator (GELINA) at IRMM and with data from the neutron time-of-flight facility (nTOF) at CERN. Note that these values are *preliminary*; they are reasonable starting values which should be fine-tuned on measurements of well-known resonances (i.e., on resonances that have been measured many times at different installations). To invoke these values automatically (without the option to flag them for varying), use one of the following phrases for the first line of card set 14:

```
GEEL DEFAULT values for resolution parameters
GELINa DEFAULT values
NTOF DEFAULT values
```

With the RPI/GELINA/nTOF resolution function, it is necessary to specify whether the resolution function should be used exactly as given in the input or whether, instead, it should be shifted so that it is centered on the current energy. To center the function, include one of the phrases

```
SHIFT RPI RESOLUTION function to center
SHIFT GEEL RESOLUTION function to center
SHIFT GELINA RESOLUTION function to center
SHIFT NTOF RESOLUTION function to center
```

in the command section of the INPut file. To use the function exactly as given in the input, include one of the phrases

DO NOT SHIFT RPI RESolution function to center
DO NOT SHIFT GEEL Resolution function to center
DO NOT SHIFT GELINA resolution function to center
DO NOT SHIFT NTOF Resolution function to center

Many test cases provide examples of input for the RPI resolution function; see, for example, tr053, tr054, tr090, tr094, tr095, tr115, or tr136. For examples using the GELINA and nTOF resolution function, see test cases tr104, tr107, and (especially) tr108.

Table III C3 b.1. Default values for parameters for RPI resolution function

	Parameter name	Value for transmission “RPI Transmission”	Value for capture ^a “RPI Capture”	Units
1	$p = 2 \sqrt{\ln 2} / w$			Ns
2	τ_1	326 .	381 .	Ns
3	τ_2	0 .0241	0 .0058	per eV
4	τ_3	323 .	323 .	Ns
5	τ_4	0 .029	0 .094	per eV
6	τ_5	240 .	105 .	Ns
7	τ_6	0 .	0 .	Ns
8	τ_7	0 .	0 .	[dimensionless]
9	Λ_0	686 .5	686 .5	Ns
10	Λ_1	-224 .9	-224 .9	Ns
11	Λ_2	21 .04	21 .04	ns
12	Λ_3	0 .	0 .	ns
13	Λ_4	0 .	0 .	[dimensionless]
14	a_1	-0 .000985	-0 .001106	per ns
15	a_2	0 .0241	0 .0058	per eV
16	a_3	-0 .000626	0 .04752	per ns
17	a_4	3 .531	65 .083	per eV
18	a_5	0 .001029	0 .001264	per ns
19	a_6	0 .	0 .	per ns
20	a_7	0 .	0 .	[dimensionless]
21	t_0	940 .	940 .	ns
22	A_2	-65 .638	-65 .638	[dimensionless]
23	A_3	0 .005	0 .005	per ns
24	A_4	0 .39383	0 .39383	[dimensionless]
25	A_5	0 .0008	0 .0008	per ns
next	B_i	0 .0	0 .0	
last	c			ns

^a Values listed in this column are *not* necessarily those that are appropriate for the RPI capture resolution function, which has not yet been fully defined; these values are for illustrative purposes only.

Table III C3 b.2. Parameters suitable for use with experimental data from GELINA at IRMM and from nTOF at CERN. Values are from preliminary work of F. Gunsing [FG05]. Parameters not listed in this table have value zero. Test case tr108 contains these values

Parameter name	Value for GELINA 90-degree flight path ^a	Values for nTOF	Units
τ_5	-0.7722	-3.7004	ns
τ_6	1363.85	-684.39	ns
τ_7	-0.5322	-0.5189	[dimensionless]
Λ_0	1.4460	3.8457	ns
Λ_3	454.9720	502.9930	ns
Λ_4	-0.5077	-0.4155	[dimensionless]
a_1	0.0	-0.0381	per ns
a_2	0.0	9.974×10^{-6}	per eV
a_3	0.04152	-0.01172	per ns
a_4	-5.847×10^{-6}	0.0001019	per eV
a_5	-0.0415	0.05009	per ns
a_6	9.247×10^{-6}	0.0	per ns
a_7	0.5961	0.0	[dimensionless]
A_2	1.0	1.0	[dimensionless]
A_4	-1.0	-1.0	[dimensionless]
A3SQE (A_3): a_{35}	0.0003047	-0.0001689	per [ns \times (eV) ^{1/2}]
A3SQE (A_3): a_{36}	7.818×10^{-5}	0.0004254	per [ns \times (eV) ^{1/2}]
A3SQE (A_3): a_{37}	-2.011	-0.06043	[dimensionless]
A3SQE (A_5): a_{55}	0.007331	0.0002766	per [ns \times (eV) ^{1/2}]

^aThe GELINA resolution function refers to the beam only and does not include a contribution from a detection system.