

PACE4 version 4.18
LISE++ package version 9.2.75

IDIST should be > 0 to have access to the "Particle analysis" group

The screenshot shows the PACE4 software interface with the following parameters and options:

- NCASC**: 100 (number of cascades. (events in Monte Carlo calculation < 1 000 000))
- INPUT**: 1 (dropdown menu)
- FYRST**: 0 (parameter determining yrast line to be used. FYRST < 0 provides the G-C yrast line. < 0 Gilbert-Cameron spin cutoff parameter. EROT = (SPIN)**2/(2.*SIGSQ) != 0. EROT = rotating liquid drop rotational energy, multiplied by factor of FYRST. ==0 value changed to FYRST = 1. In both cases level density calculated at E = EX-EROT.
- BARFAC**: 0 (The program assumes the A.J.Sierk modified rotating liquid drop barrier if this is equal to 0. If you provide a fission barrier of your own, the Sierk barrier will be renormalized accordingly. If BarFac is positive it will be taken as the desired zero spin fission barrier. If BarFac is negative, its absolute value will be taken as a factor to multiply the Sierk barrier.)
- ARATIO**: 1 (Ratio of the Fermi gas level density parameter 'LITTLE-A' at the saddle point to the ground state value. The saddle point level density is determined by g.s. 'LITTLE-A' * ARATIO.)
- FACLA**: 10 (level density parameter = MASS/FACLA if not zero. if ==0 Gilbert and Cameron value used.)
- IDIST** (Limits of residual yields (in %) to show angular and energy distributions):
 - =0 brief, schematic results of particle spectra and list of evaporated (residual) nuclei
 - =1 detailed angular and energy distribution of residual nuclei and evaporated particles.
 - =2 detailed(1) + transmission coefficients for particle emission
- MDIR** (MDIR=1 - it is appropriate for deep inelastic fragment deexcitation):
 - = 0 Compound nucleus is initially in M=0 states and the Z-axis is the recoil axis.
 - = 1 Compound nucleus is initially in M=J states, the Z axis is perpend. to recoil direction.
- ITRAC** (it controls the degree of event traceback):
 - = 0 produces compact traceback, summed over all residues.
 - = 1 detailed traceback leading to each individual isotope separately.
- NOSHL** (uses AME2003 values (A,W&T, NPA 729, 2003, pp.336-676) or Lysekil masses with shell correction):
 - =0 uses AME2003 values (A,W&T, NPA 729, 2003, pp.336-676)
 - =1 uses Lysekil masses with shell correction
- Particle analysis** group (highlighted in red):
 - Create output file
 - neutron
 - proton
 - alpha

"Particle analysis" group

The code operates under MS Windows environment and provides a highly user-friendly interface. It can be freely downloaded from the following internet addresses:

<http://www.nsci.msu.edu/lise>

“particles” is extension of output file of particle analysis.

File Name and location are the same as input file name and location.

If input file name is absent, then output particle analysis file will be “Untitled.particles” in the “<PACE4 code location> \files” directory.

Default <PACE4 code location> - where the LISE++ code has been installed

Detailed analysis of Emitted particles: "test.particles"

Decay Mode	N	Chain	Z_f final	N_f final	Zc emitter	N_c emitter	J_c init	J_f final	M_Jc proj-n	Fission prob	Ex_i MeV	Ex_f MeV	Ep_Lab MeV	Ap_Lab deg
1	1	1	64	82	70	102	82	82	0	7.5e-02	287.3	268.5	14.6	045.8
2	1	2	68	84	70	102	23	21	0	3.4e-04	287.3	262.5	13.5	110.0
1	1	3	65	85	70	102	23	23	0	3.4e-04	287.3	265.5	14.1	084.5
2	1	4	65	82	70	102	64	60	0	7.9e-02	287.3	265.5	13.7	040.4

PACE4 [test.in]

First page Refresh Results Exit

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C:/Program Files (x86)/LISEbeta/files/test.out
v.Version 4.10 12:39 08-03-11

      P A C E  4

      modified JULIAN

***** projection angular-momentum coupled evaporation Monte Carlo *****
***** angular distributions obtained using M-states of angular momentum *****

                                         MODE=1

***** Fusion xsection taken from Bass model
Bass fusion xsection for E = 500.0 MeV is 2047 mb
Fusion radius = 9.35 fm. Barrier height is 115.37 MeV
Transmission probability for a one-dimens.barrier: Classical

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Starting conditions
      Z      N      A      Spin
Projectile  20   28   48     0.0
Target     50   74  124     0.0
Compound nucleus  70  102  172

Bombarding energy (MeV)                500.00
Center of mass energy (MeV)             360.47
Compound nucleus excitation energy (MeV) 287.275
Q-value of reaction (MeV)               -73.191
Compound nucleus recoil energy (MeV)     139.535
Compound nucleus recoil velocity (cm/ns) 1.252e+00
Compound nucleus velocity/c             4.174e-02
Beam velocity (cm/ns)                   4.487e+00
    
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Detailed analysis of Emitted particles: "Untitled.particles"

Decay Mode	N mode	N All	Chain	Z_f final	N_f final	Z_c emitter	N_c emitter	J_c init	J_f final	M_Jc proj-n	Fission prob	Ex_i MeV	Ex_f MeV	Ep_Lab MeV	Ap_Lab deg
1	1	1	1	70	93	70	102	58	54	0	1.5e-03	143.1	126.5	6.5	115.0
1	2	2	2	68	90	70	102	24	21	0	4.5e-05	143.1	127.5	7.2	087.1
1	3	3	35	67	91	70	102	24	26	0	4.5e-05	143.1	131.5	1.7	136.6
1	4	4	81	66	91	70	102	24	23	0	4.5e-05	143.1	130.5	2.2	151.1
1	5	5	3	69	92	70	102	22	22	0	3.1e-05	143.1	132.5	3.5	056.4
1	6	6	23	70	91	70	102	22	21	0	3.1e-05	143.1	133.5	2.5	049.2
1	7	7	4	70	92	70	102	52	48	0	5.5e-04	143.1	129.5	6.9	059.0
1	8	8	33	70	92	70	102	52	46	0	5.5e-04	143.1	126.5	7.8	093.0
1	9	9	80	68	91	70	102	52	51	0	5.5e-04	143.1	133.5	1.9	065.5
1	10	10	100	69	93	70	102	52	47	0	5.5e-04	143.1	127.5	10.3	041.8
1	11	11	31	70	92	70	102	31	31	0	4.7e-05	143.1	132.5	3.8	051.1

Decay mode : type of particle emitted 1-n, 2-p, 3-alpha

N mode : number of emitted particle in this mode (for example "p")

N all : number of emitted particle in all modes (n,p,a)

Chain : Number of chain (cascade)

Z_f, N_f : Z and N of the final nucleus in the chain of decay

Z_c, N_c : Z and N of emitting nucleus (if Z_c is negative, it means that the nucleus fissioned)

J_c, J_f : initial and final spin indices for this particle emission indices for this particle emission

M_Jc : the projection of J_c on the Z-axis.

(Fractional spins are neglected for the projection. For J_c, J_f, the actual spin = J_c, J_f-1 in even mass nucleus, J_c, J_f-1/2 in odd mass nucleus)

Fission prob : Fission probability

Ex_i : excitation energy at emitting level (MeV)

Ex_f : excitation energy at final level (MeV)

Ep_Lab : emitted particle energy in the Lab. System (MeV)

Ap_Lab : emitted particle angle in the Lab. System (degrees)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Decay	N	N	Chain	Z_f	N_f	Zc	N_c	J_c	Jf	M_Jc	Fission	Ex_i	Ex_f	Ep_Lab	Ap_Lab
2	Mode	mode	All		final	final	emitter	emitter	init	final	proj-n	prob	MeV	MeV	MeV	deg
3	1	1	1	1	65	81	70	102	61	55	0	7.90E-03	431.5	407.5	22.6	38
4	1	2	2	47	58	73	70	102	61	63	0	7.90E-03	431.5	421.5	0.1	174.2
5	1	3	3	96	60	76	70	102	61	58	0	7.90E-03	431.5	417.5	5.8	78.4
6	2	1	4	2	53	74	70	102	46	46	0	2.20E-03	431.5	406.5	20.6	63.4
7	1	4	5	3	62	78	70	102	48	42	0	2.60E-03	431.5	396.5	36.3	33.3
8	2	2	6	21	64	80	70	102	48	43	0	2.60E-03	431.5	403.5	20.3	83.8
9	1	5	7	70	58	77	70	102	48	50	0	2.60E-03	431.5	406.5	12.7	112.7
10	1	6	8	4	57	70	70	102	57	50	0	5.50E-03	431.5	405.5	11.6	133.6
11	1	7	9	29	57	75	70	102	57	59	0	5.50E-03	431.5	413.5	13.5	52.1
12	1	8	10	5	64	80	70	102	42	42	0	1.50E-03	431.5	411.5	12.5	75.8
13	1	9	11	22	60	76	70	102	42	41	0	1.50E-03	431.5	416.5	4.4	107.2
14	1	10	12	55	57	75	70	102	42	40	0	1.50E-03	431.5	418.5	9.7	26.2

I. Select range

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Decay	N	N	Chain	Z_f	N_f	Zc	N_c	J_c	Jf	M_Jc	Fission	Ex_i	Ex_f	Ep_Lab	Ap_Lab
2	Mode	mode	All		final	final	emitter	emitter	init	final	proj-n	prob	MeV	MeV	MeV	deg
51	1	1871	2516	2	53	74	53	76	7	6	6	0.00E+00	24.5	15.5	2.1	10.3
52	1	1874	2519	2	53	74	53	75	6	6	5	0.00E+00	15.5	8.5	0.8	20.2
53	1	4	5	3	62	78	70	102	48	42	0	2.60E-03	431.5	396.5	36.3	33.3
54	1	133	176	3	62	78	70	101	42	37	5	1.30E-03	396.5	384.5	1.9	143.8
55	1	198	261	3	62	78	70	100	37	30	4	1.10E-03	384.5	362.5	16.3	62.1
56	3	36	335	3	62	78	70	99	30	16	-1	7.30E-04	362.5	338.5	46	25.2
57	1	438	576	3	62	78	68	97	16	12	2	0.00E+00	338.5	325.5	3.2	127.2
58	2	87	648	3	62	78	68	96	12	12	0	0.00E+00	325.5	293.5	28.3	65.8
59	2	102	753	3	62	78	67	96	12	14	-2	0.00E+00	293.5	276.5	14.4	56.4
60	1	624	818	3	62	78	66	96	14	11	-3	0.00E+00	276.5	265.5	6.4	27.9
61	1	689	899	3	62	78	66	95	11	14	-1	0.00E+00	265.5	251.5	9.3	63.7
62	1	746	971	3	62	78	66	94	14	12	4	0.00E+00	251.5	239.5	7.2	27.7
63	1	802	1046	3	62	78	66	93	12	10	5	0.00E+00	239.5	228.5	9.1	6.4
64	1	850	1116	3	62	78	66	92	10	10	5	0.00E+00	228.5	215.5	1.1	162.5
65	3	126	1183	3	62	78	66	91	10	6	5	0.00E+00	215.5	196.5	36.8	26.7
66	1	1096	1450	3	62	78	64	89	6	6	3	0.00E+00	196.5	185.5	3.8	89.3
67	2	207	1521	3	62	78	64	88	6	5	3	0.00E+00	185.5	161.5	10.3	147.4
68	1	1194	1593	3	62	78	63	88	5	6	3	0.00E+00	161.5	151.5	3	56.9
69	2	226	1659	3	62	78	63	87	6	5	4	0.00E+00	151.5	134.5	12	78.8
70	1	1297	1724	3	62	78	62	87	5	11	2	0.00E+00	134.5	121.5	9.9	48.5
71	1	1363	1807	3	62	78	62	86	11	10	1	0.00E+00	121.5	101.5	9.1	110.3
72	1	1416	1880	3	62	78	62	85	10	6	5	0.00E+00	101.5	88.5	10	43.9
73	1	1470	1957	3	62	78	62	84	6	8	1	0.00E+00	88.5	77.5	3	66.2
74	1	1516	2018	3	62	78	62	83	8	11	1	0.00E+00	77.5	65.5	5.3	73.3
75	1	1569	2088	3	62	78	62	82	11	8	2	0.00E+00	65.5	45.5	4.4	160.8
76	1	1612	2149	3	62	78	62	81	8	9	2	0.00E+00	45.5	35.5	4.1	24
77	1	1652	2207	3	62	78	62	80	9	5	2	0.00E+00	35.5	22.5	4.5	29
78	1	1688	2260	3	62	78	62	79	5	9	2	0.00E+00	22.5	11.5	0.8	117
79	1	6	8	4	57	70	70	102	57	50	0	5.50E-03	431.5	405.5	11.6	133.6

II. Sort

1st level : Chain

(from smallest to largest)

2nd level : Ex_i

(largest to smallest)