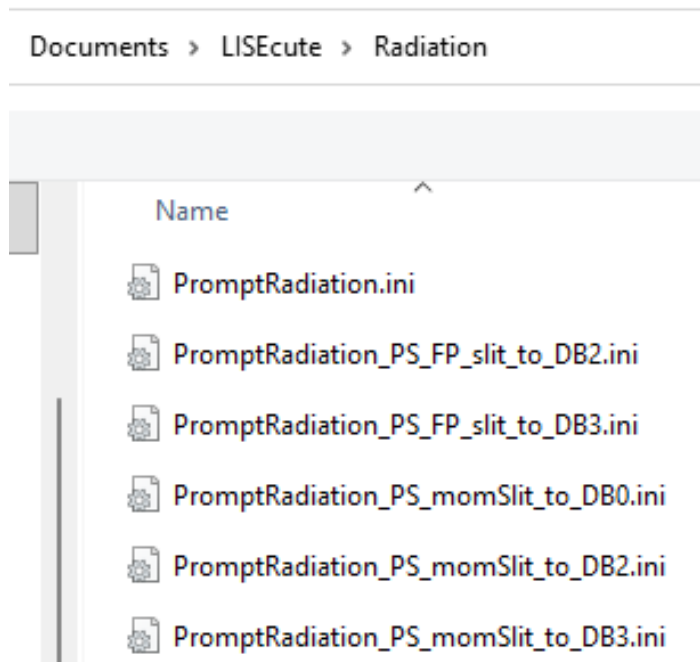


v.18.5.19
07/30/26



The Radiation INI files provide ready-to-use configurations for block-by-block light-particle production calculations in ARIS. Each file defines:

- define the slit block to hide during the Phase 2 calculation;
- define the downstream block to calculate;
- keep Prompt Radiation settings reproducible.

Distributed with the LISE⁺⁺ package in the Radiation folder.

Different INI files represent different combinations of slit location and calculation endpoint—for example, from the preseparator momentum slits to BTS02, DB2, or DB3, and from the focal-plane slits to DB2 or DB3.

LISE file for analysis; Power deposition

Projectile 82 **Se** 34+
227 MeV/u 30 kW

Fragment 61 **Ca**

Target 12 **C** 8 mm

Stripper

BTS01a_PTS standard : 50.2 cm

rotate_PS Angle= +90 deg

BTS01b_D1ex Bp=5.8000 Tm

BTS01c_D1081 standard : 61.65 cm

Beam_Dump 1 finger : -300 mm

Frag_Catchers slits

-55 H +55

BTS01d standard : 1.66 m

BTS01e_WDG Bp=5.8000 Tm

PS_Mom_slits slits

-30 H +45

PS_wdg Al₉₉ Zn₂₅ Mg 1.05 mm

BTS02 Bp=5.6425 Tm

BTS03 Bp=5.6425 Tm

PS_FP_slit slits

-12 H +12

unrotate_PS Angle= -90 deg

Power deposition in blocks and rate analysis: c_Psk3a0_CB2a0f_61Ca_8mm_RadiationTest.Ipp

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Rate analysis by reactions

#	Block	All frags	ProjFrag	SecTarg1	SecTarg2	SecTarg3
1	Target	2.69e+12	2.69e+12	0	0	0
2	Stripper	2.69e+12	2.69e+12	0	0	0
3	BTS01a_PTS	6.60e+11	6.60e+11	0	0	0
4	rotate_PS	6.60e+11	6.60e+11	0	0	0
5	BTS01b_D1ex	6.60e+11	6.60e+11	0	0	0
6	BTS01c_D1081	6.60e+11	6.60e+11	0	0	0
7	Beam_Dump	8.71e+09	8.71e+09	0	0	0
8	Frag_Catchers	8.71e+09	8.71e+09	0	0	0
9	BTS01d	8.71e+09	8.71e+09	0	0	0
10	BTS01e_WDG	8.71e+09	8.71e+09	0	0	0
11	PS_Mom_slits	1.43e+08	1.43e+08	0	0	0
12	PS_wdg	1.42e+08	1.42e+08	0	0	0
13	BTS02	1.42e+08	1.42e+08	1.20e+04	0	0
14	BTS03	1.42e+08	1.42e+08	1.20e+04	0	0
15	PS_FP_slit	5.36e+01	2.94e-02	5.35e+01	0	0
16	unrotate_PS	5.36e+01	2.94e-02	5.35e+01	0	0
17	correction_matrix	5.36e+01	2.94e-02	5.35e+01	0	0
18	CD1_BTS05	4.29e+01	2.94e-02	4.29e+01	0	0
19	DB2_slits	4.29e+01	2.94e-02	4.29e+01	0	0
20	DB2_Wedge	4.27e+01	2.89e-02	4.27e+01	0	0
21	CD2_BTS06	4.06e+01	2.85e-02	4.06e+01	7.21e-03	0
22	DB3_slit	2.81e-02	2.80e-02	0	8.76e-05	0
23	DB3_wdg	2.81e-02	2.80e-02	0	8.76e-05	0
24	DB3_TID	2.80e-02	2.79e-02	0	8.74e-05	0
25	CD3_BTS07	2.41e-02	2.40e-02	0	7.49e-05	4.07e-05
26	DB4_slit	2.41e-02	2.40e-02	0	7.49e-05	8.86e-07
27	CD4_BTS08	2.41e-02	2.40e-02	0	7.49e-05	8.86e-07
28	DB5_PPACs	2.41e-02	2.40e-02	0	7.49e-05	8.86e-07
29	DB5_slit	2.41e-02	2.40e-02	0	7.49e-05	8.86e-07
30	DB5_PIN	2.39e-02	2.38e-02	0	7.46e-05	8.80e-07
31	DB5_TKE_SCI	2.82e-05	0	0	2.82e-05	7.04e-11

From PS_mom_slits to DB*

PS_mom_slits	in front of DB0			Rank	Isotope	Phase	Location	Reaction	DB0.x	Rate	W
Phase 1	Power	3.0E-02	W	1	4He	2	P2p_L	PF	8.14E+02	2.19E+08	3.52E-02
	Total rate	1.4E+08	pps	2	4He	1	P4m	PF	-1.48E+02	7.33E+07	1.60E-02
Phase 2	Power	4.0E-02	W	3	4He	1	P3m	PF	-1.80E+02	3.11E+07	6.78E-03
	Total rate	2.9E+08	pps	4	3H	2	P2p_L	PF	7.94E+02	2.59E+07	1.53E-03
Phase 1+2	Power	7.0E-02	W	5	3H	1	P4m	PF	-1.49E+02	7.91E+06	6.19E-04
	Total rate	4.3E+08	pps	6	2H	1	P4m	PF	-1.50E+02	3.95E+06	4.25E-04
	Power			7	1H	2	P4p_L	PF	1.36E+02	2.53E+06	3.92E-04
	Total rate			8	2H	2	P2p_L	PF	3.92E+02	7.58E+06	7.27E-04
	Power			9	1H	1	P4m	PF	-1.50E+02	1.69E+06	2.78E-04
	Total rate			10	3H	1	P3m	PF	-1.80E+02	3.83E+06	3.00E-04

Total rate in front of this block from the Power deposition utility

1.4e8 pps

Pr.Rad.Utility
4.3e8

PS_mom_slits	in front of DB2			Rank	Isotope	Phase	Location	Reaction	DB0.x	Rate	W
Phase 1	Power	8.6E-07	W	1	2H	2	P5_L	PF	3.90E+01	4.07E+05	4.33E-05
	Total rate	8.2E+03	pps	2	2H	2	P5_L	T1	4.18E-02	9.35E+03	9.68E-07
Phase 2	Power	4.5E-02	W	3	2H	1	P5	T1	4.19E-02	7.53E+03	7.79E-07
	Total rate	4.2E+05	pps	4	1H	2	P5_L	PF	3.24E+01	8.24E+02	1.33E-07
Phase 1+2	Power	4.5E-02	W	5	3H	2	P5_L	T1	9.48E-02	3.45E+02	2.59E-08
	Total rate	4.3E+05	pps	6	3H	1	P5	T1	9.47E-02	2.79E+02	2.09E-08
	Power			7	6He	2	P5_L	T1	6.92E-02	1.52E+02	2.29E-08
	Total rate			8	6He	1	P5	T1	6.93E-02	1.23E+02	1.84E-08
	Power			9	12B	2	P5_L	T1	2.68E-02	1.09E+01	4.94E-09
	Total rate			10	12B	1	P5	T1	2.68E-02	1.09E+01	4.94E-09

4.3e1 pps

Pr.Rad.Utility
4.3e5

PS_mom_slits	in front of DB3			Rank	Isotope	Phase	Location	Reaction	DB0.x	Rate	W
Phase 1	Power	5.0E-09	W	1	2H	2	P5_L	PF	3.88E+01	3.50E+04	3.71E-06
	Total rate	3.4E+01	pps	2	2H	2	P5_L	T1	3.80E+01	1.38E+03	1.42E-07
Phase 2	Power	3.9E-06	W	3	3H	2	P5_L	T1	3.70E+01	5.22E+01	3.90E-09
	Total rate	3.7E+04	pps	4	2H	1	P5	T1	3.80E+01	2.57E+01	2.66E-09
Phase 1+2	Power	3.9E-06	W	5	6He	2	P5_L	T1	3.52E+01	2.41E+01	3.61E-09
	Total rate	3.7E+04	pps	6	7Li	1	P5	T1	3.54E+01	3.12E+00	8.62E-10
	Power			7	12B	1	P5	T1	3.28E+01	1.43E+00	6.44E-10
	Total rate			8	12B	2	P5_L	T1	3.28E+01	1.43E+00	6.44E-10
	Power			9	8Li	2	P5_L	T1	3.45E+01	1.73E+00	4.28E-10
	Total rate			10	8Li	1	P5	T1	3.45E+01	1.39E+00	3.45E-10

4.1e1 pps

Pr.Rad.Utility
3.7e4

Total rate in front
of this block
from the Power
deposition utility

DB1_slits	in front of DB2			Rank	Isotope	Phase	Location	Reaction	DB0.x	Rate	W
Phase 1	Power	2.3E-07	W	1	4He	2	P3m_L	PF	-2.79E+02	4.43E+07	7.29E-03
	Total rate	2.1E+03	pps	2	4He	2	P2m_L	PF	-3.23E+02	2.28E+07	3.75E-03
Phase 2	Power	1.3E-02	W	3	2H	2	P4m_L	PF	-1.25E+02	2.94E+06	2.79E-04
	Total rate	8.8E+07	pps	4	3H	2	P3m_L	PF	-2.81E+02	4.02E+06	2.31E-04
Phase 1+2	Power	1.3E-02	W	5	3H	2	P2m_L	PF	-3.33E+02	3.93E+06	2.25E-04
	Total rate	8.8E+07	pps	6	2H	2	P3m_L	T1	-2.18E+02	3.96E+05	3.56E-05
				7	6Li	2	P2m_L	PF	-5.13E+02	5.86E+05	1.17E-04
				8	6He	2	P2m_L	PF	-9.11E+02	2.31E+06	1.34E-04
				9	7Li	2	P2m_L	PF	-7.65E+02	9.73E+05	1.29E-04
				10	2H	2	P4m_L	T1	-1.40E+02	2.34E+05	2.11E-05
DB1_slits	in front of DB3			No.	Isotope	Phase	Location	Reaction	DB0.x	Rate	W
Phase 1	Power	1.7E-08	W	1	2H	2	P5_L	T2	3.79E+01	7.07E+03	7.31E-07
	Total rate	8.5E+01	pps	2	6He	2	P5_L	T2	3.52E+01	1.49E+02	2.23E-08
Phase 2	Power	7.6E-07	W	3	3H	2	P5_L	T2	3.71E+01	1.28E+02	9.58E-09
	Total rate	7.4E+03	pps	4	2H	1	P5	T1	3.80E+01	5.14E+01	5.31E-09
Phase 1+2	Power	7.8E-07	W	5	7Li	1	P5	T1	3.54E+01	6.23E+00	1.72E-09
	Total rate	7.4E+03	pps	6	12B	1	P5	T1	3.28E+01	2.86E+00	1.29E-09
				7	8Li	1	P5	T1	3.45E+01	2.78E+00	6.90E-10
				8	9Be	1	P5	T1	3.45E+01	1.96E+00	7.46E-10
				9	10Be	1	P5	T1	3.37E+01	2.18E+00	7.61E-10
				10	4He	1	P5	T1	3.71E+01	1.86E+00	3.88E-10

4.3e1 pps

Pr.Rad.Utility
8.8e7

4.1e1 pps

Pr.Rad.Utility
7.4e3

All nuclei are produced in wedges.
Strongest Phase2 component:
near central axis, DB3.x $\approx$ +35 mm

- Phase 2 strongly dominates over Phase 1 for DB2 and DB3.
- DB1 → DB2 shows about 7 orders of magnitude enhancement.
- PS momentum slits and DB1 slits show more than 3 orders of magnitude enhancement.
- Stronger collimation may be required at several ARIS locations.
- The active detector area at DB3 should be minimized to reduce the total particle rate recorded by the detector; a large-area detector is not required.

- Current calculations do not include Phase 2 products inside downstream slit material.
- Upstream Phase 2 products can be treated only as Phase 1 particles at the next slit.
- Overcoming this limitation will require the development and implementation of a more advanced multi-stage calculation algorithm.
- PHITS comparison is needed, especially before and after the DB3 slits.
- Lithium-isotope Phase 2 rates are surprisingly high; slit thickness should be optimized.
- Existing monitor factors are not sufficient for non-reference configurations.