

Shell:

- Array operations
- Block "Material" : no more "slits" features
- Periodic table of elements
- [Moving to new official version 12](#)

Transmission, Utilities:

- [RF-kicker update \(angle issue\)](#)
- [Transmission with Rotation blocks: analytical solution update](#)
- [Modification of transmission calculations for accumulated uncertainties](#)
- [Gas-Cell utility update: plot of transmitted isotopes](#)

Physics:

- [Fragment deformation at the Scission point](#)
- [Fission plots update](#)
- [Abrasion-Ablation Excitation energy: Limiting temperature factor, and new plots](#)
- [Gas Mixture Density](#)

Excel :

- [LISE⁺⁺ for Excel: PID resolution calculator update](#)
- [A1900 PID calibration with LISE for Excel \(32-bit\)](#)
- [FRIB rates v.1.08](#)

Array operations

Block	Given Name	Z-Q	Length,m	Enable
	Target			+
	Stripper			+
	= Dipole D1	0	8.719	+
	slits I1_slits		0	+
	Wedge I1_wedge			NO
	= Dipole D2	0	8.767	+
	Material I2_PPAC0			NO
	slits I2_slits		0	+
	Wedge I2_wedge			+
	Material I2_PPAC1			NO
	Material I2_SCI			NO
	= Dipole D3	0	8.767	+
	slits I3_slits		0	NO
	Wedge I3_wedge			NO
	= Dipole D4	0	9.39	+
	Material FP_PPAC0			+
	Material FP_PPAC1			+
	slits FP_slits		0	+
	Material XF_SCI			NO

Operations with block arrays

Operations

make Enable

make Disable

Delete

Copy

Move

Array definition

First (or Last) Block of Array:

Last (or First) Block of Array:

Number of blocks in the Array =

Insert After BLOCK:

Execute
 Quit

Selected block

Enable

Let call automatically Block Length [m]

Block name = Length after this block [m]

Charge State [Z-Q] = Sequence number

Total

Number of Blocks

Length [m]

Delete

Array operations

OK

Help

dispersive

Dispersive (M-dipole)

Wien velocity filter

Electrostatic dipole

Gas-filled separator

Compensating Dipole

dispersive RF-based

RF separator

RF buncher

non-dispersive

Drift (multipole,slits)

Beam Rotation

Shift of Optical Axis

Solenoid

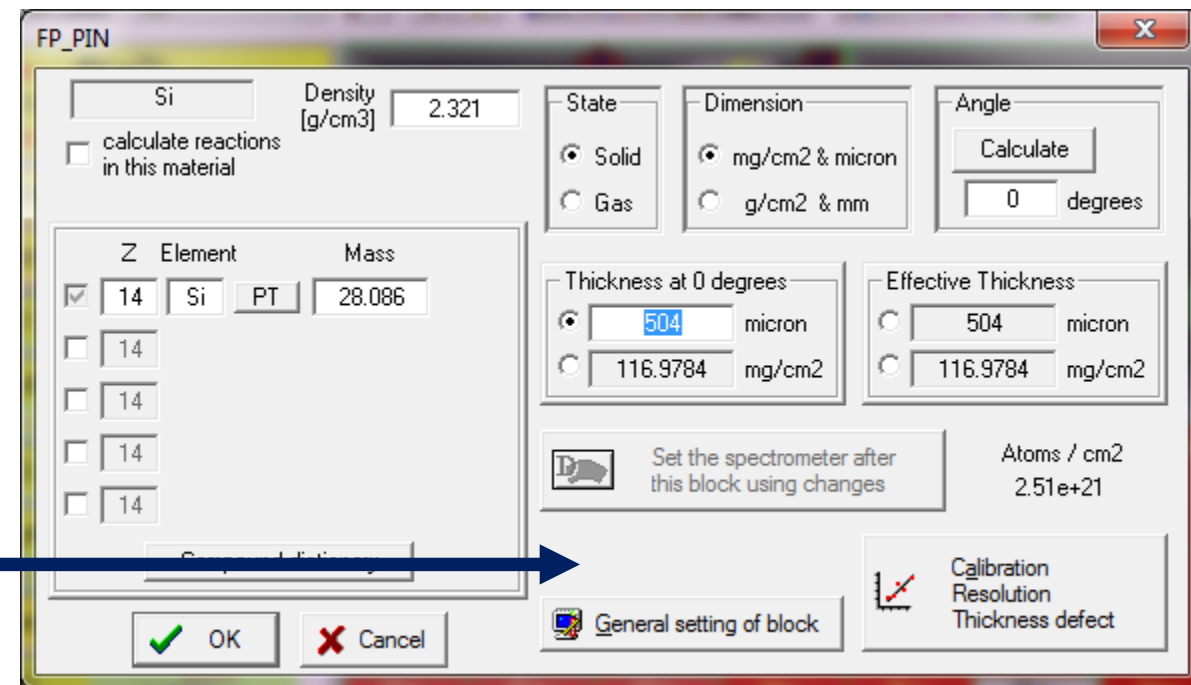
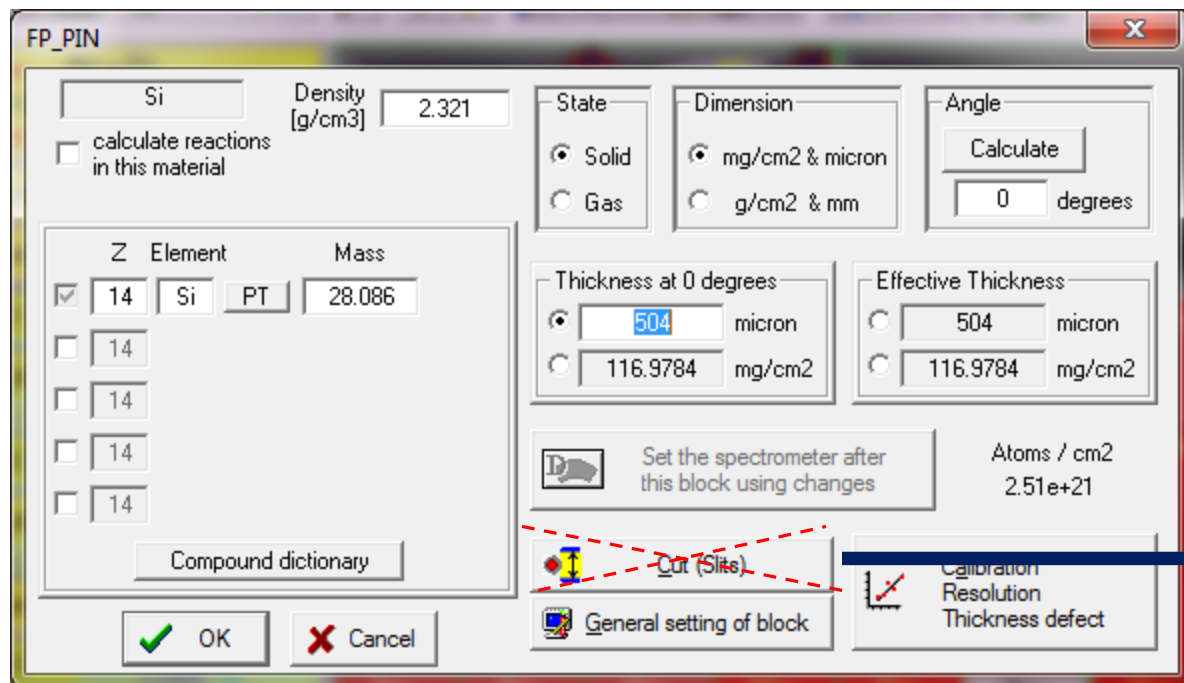
special (no beam dynamics changes)

Delay (efficiency) block

Fitting constraints

v. 10.0.6

Since v.10.0.71



Stripper

Density 2.2

Z Element Mass

6 C PT 12.011

14

14

14

Compound dictionary

Periodic Tables of Elements

PERIODIC TABLE OF ELEMENTS

Li Be B C N O F Ne

Na Mg Al Si P S Cl Ar

K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr

Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe

Cs Ba La Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn

Fr Ra Ac Rf Db Sg Bh Hs Mt Ds Rg Cn Nh Fl Mc Lv Ts Og

BMP

Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu

Th Pa U Np Pu Am Cm Bk Cf Es Fm Md No Lr

Cancel

Periodic Table of Elements

Zoom In Zoom Out

Group 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Alkali metals Alkaline earth metals Pnictogens Chalcogens Halogens Noble gases

Period 1 2 3 4 5 6 7

1 (red)=Gas 3 (black)=Solid 80 (green)=Liquid 109 (gray)=Unknown

Color of the atomic number shows state of matter (at 0 °C and 1 atm)

Alkali metal Alkaline earth metal Lanthanide Actinide Transition metal

Post-transition metal Metalloid Nonmetal Unknown chemical properties

Reactive nonmetal Noble gas

Background color shows subcategory in the metal-metalloid-nonmetal trend

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Hydrogen 1 H 1.008	Lithium 3 Li 6.94	Beryllium 4 Be 9.0122	Sodium 11 Na 22.990	Potassium 19 K 39.098	Rubidium 37 Rb 85.468	Cesium 55 Cs 132.91	Francium 87 Fr [223]	Helium 2 He 4.0026	Neon 10 Ne 20.180	Argon 18 Ar 39.88	Krypton 36 Kr 83.798	Xenon 54 Xe 131.29	Radon 86 Rn [222]					




Border shows natural occurrence of the element

wikipedia.org

Help

- Contents
- View of spectrometers
- Update My Documents\LISE with last installation user files
- Check for the new version
- Contact to us
- Register now
- Our web-sites
- Partner sites
- Periodic Table of Elements**
- About...

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Changing a global LISE⁺⁺ version





- What are main modifications (development and so on) in version 12?
- Where transmission (yield) changes are expected?

- New feature A1900_2019 options
- New configuration files?
- LISE.ini settings?
- Update LISE files in the new package based on A1900_2019 options

- “Open” versions to work with old LISE files
- A1900_2016 & A1900_2019 option files to switch between versions

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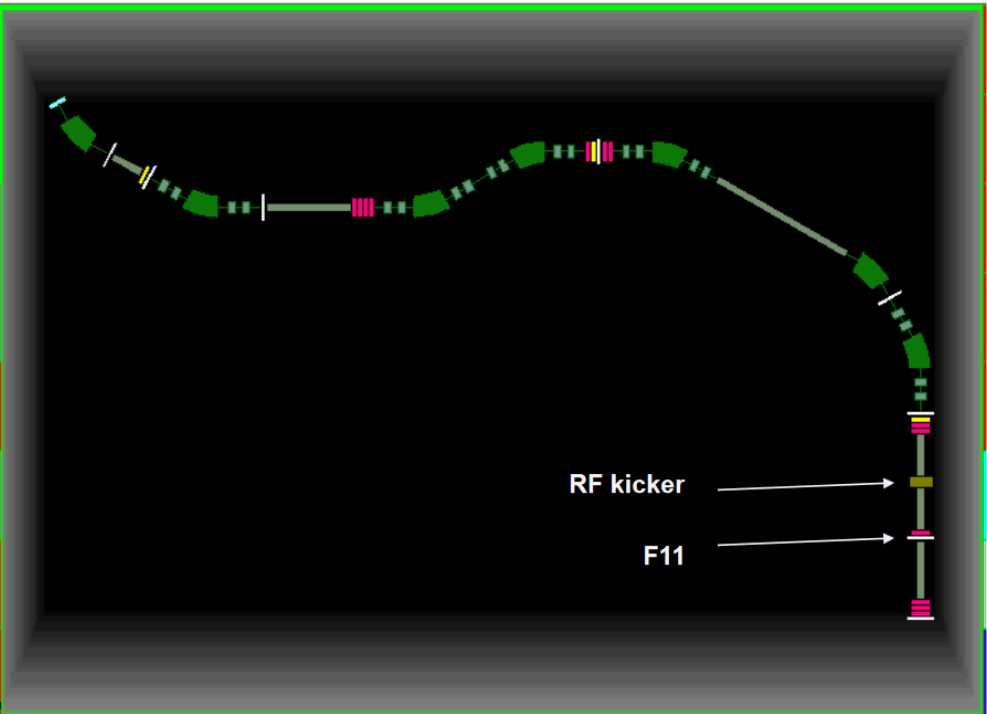
 **LISE⁺⁺ version 10.0.27: RF-kicker update** 

Toshiyuki Sumikama's request

Modification of the exit angle of a particle passing a RF-kicker due to spatial shift

v.10.0.26 : Monte Carlo solution

v.10.0.27 : Analytical solution






RF kicker


F11

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Transmission with Rotation blocks : analytical solution




http://lise.nslc.msu.edu/10_0/rotationTest.lpp

LISE⁺⁺ version
10.0.45

New internal optical block matrix :

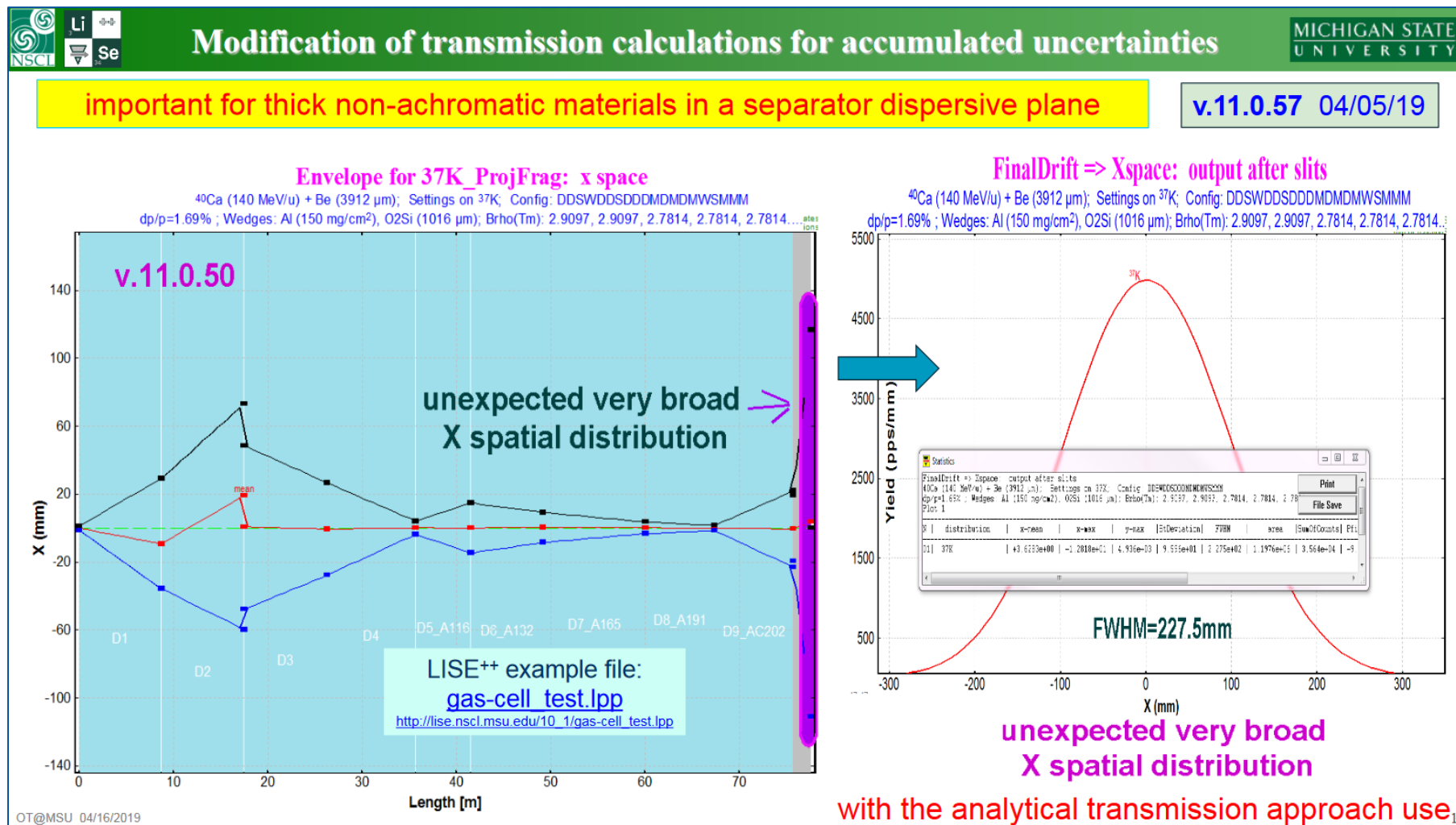
Global Rotated

(Global matrix relatively absolute 0-rotation angle)



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with the analytical transmission approach use₁

LINK

Gas-Cell utility: plot transmitted isotopes

v.11.0.50 03/14/19

Range 1D-Optimizer: Number of particles stopped in GasCell_75torr
⁴⁰Ca (140 MeV/u) + Be (3912 μm); Settings on ³⁷K; Config: DDSWDDSDDDMDMDMWSMMM
 dp/p=1.69%; Wedges: Al (150 mg/cm²), O2Si (1016 μm); Brho(Tm): 2.9097, 2.9097, 2.7814, 2.7814
 A_{yield} before FinalDegrador; B_{yield} before GasCell_75torr; C_{yield} after GasCell_75torr; Yield_{max} = 5.19e+05 pps @ 20.47 deg

Range 1D-Optimizer: Isotopes stopped in GasCell_75torr
⁴⁰Ca (140 MeV/u) + Be (3912 μm); Settings on ³⁷K; Config: DDSWDDSDDDMDMDMWSMMM
 dp/p=1.69%; Wedges: Al (150 mg/cm²), O2Si (1016 μm); Brho(Tm): 2.9097, 2.9097, 2.7814, 2.7814
 Yield_{max} = 5.20e+05 pps @ 20.51 deg

Range optimizer

Adjustable degrader: FinalDegrador
 Stopper (Gas cell): GasCell_75torr

Setting fragment intensity before the adjustable block: 1.17e+6 pps
 Backward calculations assuming the fragment starts from the middle of Gas Cell
 Degrader thickness: 1.6e+03 micron

Varying parameter of adjustable degrader:
 Thickness - varying, Inclination angle - const
 Inclination angle - varying, Thickness - const

Optimization mode:
 1D: only variation of Adjustable Degrader
 2D: Adjustable Degrader & Wedge angle variations

Monochromatic wedge:
 Wedge block: [dropdown]

Inclination Angle of Degrader:
 minimal = 0 degrees
 maximal = 45 degrees
 steps = 180

Plot versus the tilting material ANGLE:
 Calculate and plot the fraction of stopped particles of interest
 Plot already calculated isotopes stopped in this detector

Help v.6.1, Help v.9.8, Out




New feature

³⁶ Ca	³⁷ Ca	³⁸ Ca	³⁹ Ca	⁴⁰ Ca
7.18e+1	0.014%	1.07e+3	0.018%	
³⁶ K	³⁷ K	³⁸ K	³⁹ K	
1.12e+1	29.210%	0.34e+1	6%	
³⁶ Ar	³⁷ Ar	³⁸ Ar	³⁹ Ar	³⁶ Ar
1.32e+2	6.609%	3.18e+5	2.514%	
³⁶ Cl	³⁷ Cl	³⁸ Cl	³⁶ Cl	³⁷ Cl
3.59e+2	6.604%	3.6e+4	0.238%	
³⁶ S	³⁷ S	³⁸ S	³⁶ S	³⁸ S
5.01e+2	0.051%	9.18e+2	0.012%	
³⁶ P	³⁷ P	³⁸ P	³⁶ P	³⁸ P
2.78e+2	0.044%			
³⁶ Si	³⁷ Si	³⁸ Si	³⁶ Si	³⁸ Si
0.20e+1	0.029%			
³⁶ Al	³⁷ Al	³⁸ Al	³⁶ Al	³⁸ Al


LISE++ example file:
[gas-cell_test.lpp](http://lise.nsci.msu.edu/10_1/gas-cell_test.lpp)
http://lise.nsci.msu.edu/10_1/gas-cell_test.lpp

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Fragment deformation at the Scission point






Discussions with Prof.J.Benlliure are appreciated.

Version 11.0.87
07/19/19


- Update of the Fission Properties dialog
- TKE fission plots :
 - “1D-plot” menu
 - Kinematics calculator (KC)
- TKE calculation results as function of the excitation energy mode and parameters of quadrupole deformation at the scission point

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Fission plots update






Version 11.0.19

- Kinematics calculator → 2D fragment MC plot : bug for CMS velocities has been fixed
- New "Vz vs Vxy" option in CMS in the MC fission plot dialog
- Abrasion-Fission CS plots : option to plot all excitation energy region distributions together
- Abrasion-Fission TKE plots : option to plot all excitation energy region distributions together
- New feature for All (Abrasion, Coulomb, Fusion) Fission reactions: Velocity plot




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Update Abrasion Excitation energy



Version 11.0.11

- Limiting temperature distribution in the excitation energy plot
- RMS(Excitation energy) distribution from A_{pf} in the excitation energy plot
- Excitation energy plots from Z
- Apply the Limiting Temperature for excitation energy



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LISE++ version 10.1.111: Gas Mixture Density

Previous version :
Only molecular formula option
For gas density calculations




version 10.1.111 :
New "Gas Mixture" option

The user should provide the Molar mass of a gas mixture

Common Name	Atomic Stoich.	Density
Aluminum Oxide alpha	Al2 O3	3.98
Bakelite	H9 C9 O1	1.45
1-2 - Ethanediol	H6 C2 O2	1.1088
Acetylene	H2 C2	0.0010825
Acetylene	H2 C2	0.0010825
Air (gas mixture **)	O21 N78 Ar1	0.001205
Allene Propadiene	H4 C3	0.0016656
Ammonia	H3 N1	0.00070804
Butane	H10 C4	0.0024164
1-3-Butadiene	H6 C4	0.0022488
Carbon Dioxide	C1 O2	0.0018296
Carbon Tetrafluoride	C1 F4	0.0036586
Cyclobutane	H8 C4	0.0023326
Cyclopropane	H6 C3	0.0017495
Cyclopropene	H4 C3	0.0016656
1-2 Difluorethane	H4 C2 F2	0.0027459
1-2 Difluorethene	H2 C2 F2	0.0026621
Ethane	H6 C2	0.0012501
Ethane - Hexafluoride	C2 F6	0.0057376
Ether Dimethyl	H6 C2 O1	0.0019153
Ethylene	H4 C2	0.0011663
Ethylene Sulfide	H4 C2 S1	0.0024994
Hydrogen Sulfide	H2 S1	0.0014169
Methane	H4 C1	0.00066697
Methane Chloro-Tri. Freongas	C1 F3 CL1	0.0043427
Methane Dichloro-Di. Freon-12	C1 F2 CL2	0.0050268
Methane Dichloro-Fl. Freon-21	H1 C1 F1 CL2	0.0042789
Nitric Oxide	N1 O1	0.0012475
Nitrous Oxide	N2 O1	0.0018298
P10 (10% Methane in Argon) **	C2 H8 Ar90	0.00159
Propane	H8 C3	0.0018333
Propylene Sulfide	H6 C3 S1	0.0030826
Sulfur Hexafluoride	F6 S1	0.006072
Water vapor	H2 O1	0.00074895

Gas density in the LISE++ compound library have been revised for standard conditions T=20°C, and 760 Torr. Gas P-10 has been added.

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New Elain's formula in LISE⁺⁺ for Excel

Version 11.0.15


- Formula
- LISE for Excel : PID resolution calculator
- New PID capabilities and features
- *Classic A, Z* technique and new PID approach

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A1900 PID calibration with LISE for Excel (32 bit)



LISE++ version 11.0.70
06-MAY-2019

Main purpose : fast and confident PID in wedge settings

- Introduction: previous the “Z \leftrightarrow data” version
- Loading “A1900 PID calibration”
- Initial settings
- A/Q-based PID (new)
- Calibration
- Global minimization
- A,Z \rightarrow data
- A,Z \leftarrow data
- Example

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FRIB rates v.1.08

LISE++ version 10.0.41

<https://groups.nsl.msu.edu/frib/rates/2017/>

Name	Last modified	Size	Description
Parent Directory			
FRIBrates v1 08.xlsm	2017-07-17 18:34	4.6M	
FRIBrates v1 08 LIST.xlsx	2017-07-17 18:28	406K	
FRIBrates v1 08a.xlsm	2017-07-17 18:34	4.6M	
FRIBrates v1 08a LIST.xlsx	2017-07-17 18:29	402K	
FRIBrates v1 08b.xlsm	2017-07-17 18:35	4.6M	
FRIBrates v1 08b LIST.xlsx	2017-07-17 18:29	401K	

Utilities | 1D-Plot | 2D-Plot | Databases | Help

- LISE++ for Excel
- CODES : Charge, Global, PACE4, etc. ▶
- Radioactivity, decays ▶
- Reactions utilities ▶
- Plots : Energy loss, Ranges, Stragglng, etc. ▶
- FRIB / NSCL / ISOL rates ▶**
- NSCL / Europe / RIKEN primary beam lists ▶
- Set-up utilities ▶
- Range optimizer (Gas cell utility)
- Gas pressure optimization for gas-filled dipole
- CATCHER utility (ISOL, Fusion-Residual)
- Rate & transmission calculation: batch mode
- Stripper foil lifetime

- plot: FRIB rates ▶**
- plot: FRIB beams ▶
- link: FRIB (v.1.06)
- Location of "FRIB" isotopes
- plot: NSCL PAC35 rates
- plot: NSCL PAC35 beams
- link: NSCL PAC35 rates
- plot: ISOL rates
- link: ISOL rates features

Utilities | 1D-Plot | 2D-Plot | Databases | Help

- LISE++ for Excel
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