## Acculinna's <sup>27</sup>S file and calibrations







0.68

225.50

0.68

225.78

#### Acculinna.xlsx file has been attached to the mail



Vise\files\examples\dubna\	•			
Name	Ext	This file uses the	Vise \calibrations	\FLNR\*.*
<u></u>		dipole calibrations	Name	Ext
acculinna_27S	lpp		<u>€[.]</u>	
Tubna_GFS	Ipp		Acculinna_B3	cal
🖶 Dubna_GFS 1.0mg	lpp		C Acculinna_B2	cal
🗧 Dubna_GFS 0.3mg	lpp		Q6	ca
<mark>≓</mark> eMSP144	lpp		🕒 Q5	ca
			🕒 Q4	cal

#### These new files have been attached to the mail





Preferences	NAMES OF A DESCRIPTION OF A DESCRIPTIONO		
- Starting files and working directories			- Options dialogs
Starting configuration at loading the program	A1900_2015.lcn	Browse	Target optimization options
Starting options file at loading the program	A1900_2015.lopt	Browse	Scheme options
Working directory Current user has administrative privilegies:	LISE++ working directory C User (options, config, etc) is	\ My Documents ++ root directory	Plot options
Calculation settings Calculation threshold = 1.0e-10 pps Dimension of distribution (NP) calculation WITHOUT charge states calculation WITH charge states wedge calculation 16 16	Calculate spectrometer settings us maximal  C mear value of the momentum distr left peak  C  C  right Charge States Calculation No  C  Yes	sing Apply to Apply t	he "Edge" effect in distribution cuts Yes (default) No (recommended for extended configurations) Section
Transmission information in the Table of Nuclides Display 1 Total: All reactions (pps) Display 2 Total ion transmission (%) Make default OK X Cancel ? Help	Utility options Vavigation map Spectrometer scheme Sound 3D-Balls Animation Primary beam scattering in - Show Fitting constraint bloc the Setup and Scheme win	a target dows	& expert options ow transmission calculation time arge State Optimization Debugging Mode stribution Debugging Mode (file 'distrib.txt') eck LIZ-file consistency (Configurations) eck LIZ-file consistency (Options) Id angles of an inclination of a target d a stripper together



## <sup>27</sup>S file modifications



х Projectile fragmentation Fragment velocity [ Momentum distribution ] Cross section, Excitation energy and etc. Final relation Vf/Vb been used in the mean = | 0.9778 32S(52.0 MeV/u) + Be -> 27S program for the setting fragment peak = 0.9915 Mean Fragment velocity Options V fragment / V beam = Velocity after reaction can not exceed fragment Constant velocity from two-body reaction kinematics (at 0) degree). It is important for pick-up reactions! Calculation - A. [V.Borrel et al., Z.Pyhs.A314(1983)191]. Assume symmetric velocity distribution around Aproj / 2. Important for light fragment production. Calculation - B. [F.Rami et al., NPA 444(1985)349] Use velocity shift for pick-up reactions Calculation - C [0.Tarasov, NPA 734(2004)536] œ R.Pffaf, D.Morrissey et al., PRC51(1995)1348 Calculation - D [from two-body reaction] Exclude this shift for (p,n) and (n,p) reactions Calculation - E [D.Morrissey, PRC 39(1989)460] at Afrag = Aproj 8 -----> dE/dA =(both default 8 MeV) at Afrag = Aproj / 2 Vf / Vb = 0.975 8 -A - V.Borrel et al., Z.Pyhs. A314(1983)191 Shift of Vf/Vb relation 0 (default 0) Vf / Vb velocity (s)  $B_n(A_p - A_F)$ 0.986 Energy necessary to  $A_{\mathbf{x}} E_{\mathbf{y}}$ MeV (default 8) 8 ablate one nucleon (Bn) B - F.Rami et al., NPA 444 (1985)349 Information (only for simple target) 0.95 g (MeV/fm2) 28 Vfrag Wbeam from Vf / Vb  $v_F$ 1.043 two-body reaction 0.982  $A_{\mathbf{F}} E_{\mathbf{P}}$ 25.1 S(MeV)  $\mathcal{V}_{p}$ 0.2 Angle (deg) Prefragment 27.7 ✓ use prefragment option 0.780 V of C.M. / Vbeam Mass. C - convolution Make default Vf / Vb (peak) Write distribution **₿**٦ 0.992 settings parameters to file 🖌 OK 🗶 Cancel Help

4







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Projectile fragmentation	THE I WA	10.0	
Fragment velocity / Momentum distribution / [C	ross section, Excit	ation energy and	etc)
	Γ	32S(52	.0 MeV/u) + Be -> 27S
Prefragment and Evaporation options	Excit	tation energy for <i>i</i>	Abrasion-Ablation model
- Cross Sections			
3 - EPAX 2.15 + user modifications			•
"FAST" mode for Abrasion-Ablation calculations*	* use this mo Evaporation	ode only for heav, distribution dimer	y projectiles as Uranium. nsion is equal to 8.
Coefficients for modified EPAX 2.15	p-rich :	slope	
U_norm [1.0] 1	U1 [1.79]	1.79	Use corrections for H,He,Li production cross
Un [1.65]	U3 [-1.3e-5]	-1.3e-5	sections
			🔲 Make default
		🗸 ок	X Cancel ? Help



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Projectile fragmentation	
Fragment velocity / Momentum distribution / Cross	s section, Excitation energy and etc.)
	32S(52.0 MeV/u) + Be -> 27S
Prefragment and Evaporation options	Excitation energy for Abrasion-Ablation model
- Cross Sections	
3 - EPAX 2.15 + user modifications	
"FAST" mode for Abrasion-Ablation calculations*	* use this mode only for heavy projectiles as Uranium. Evaporation distribution dimension is equal to 8.
Coefficients for modified EPAX 2.15	
U_norm [1.0] 1 U	1 [1.79] 1.79 Use corrections for H,He,Li production cross
n-rich slope U Un [1.65] 1.65 U	2 [4.72e-3] 0.00472 sections 3 [-1.3e-5] -1.3e-5
J	
	Make default
	V OK X Cancel ? Help



Production Mechanism	X
Reactions / Energy Loss, Straggling / Charge states / Databases: N	Masses, Isomers ∫ 32S(52.0 MeV/u) + Be -> 27S
1 - [ > 5AMeV] A.Leon et al., AD&ND Tables 69(1998)217; modified	•
Optimization of "charge state" transmission calculations (efficient if there are two or more "Material & Dispersive block' combinations)	Charge state suppression values
Calculate a charge state value for ALL points of energy distribution	- "GLOBAL" options
No (only for middle point)     Important for     low energy     Yes     Calculate if 30 MeV/u Help     Coefficients for the Leon's charge state distribution Help	<ul> <li>Always assume Equilibrium distributions</li> <li>NonEquilibrium mode for thin materials</li> <li>Upper boundary of "mixed" region (default 70 MeV/u)</li> <li>UB = 70 MeV/u</li> </ul>
Width (dn)       1       (default 1)       Zp power factor =       0.477         Correction       1       (default 1)       (default:Leon:0.477,Baron 0.447)	Use "Global" starting from Zfrag >= 2 (default 29) Charge state after reaction
Calculation method of Equilibrium thickness for "Physical Calculator" Make default	Z · Q = 0 (default 0)





Production Mechanism
Reactions (Energy Loss, Straggling) Charge states / Databases: Masses, Isomers / 32S(52.0 MeV/u) + Be -> 27S
Prefragment and Evaporation options
Energy Losses 0 - [He-base] F.Hubert et al, AD&ND Tables 46(1990)1
Energy Straggling 1 - ATIMA 1.2 (LS-theory)
Image: Shape       Image: Gaussian       Calculation       Image: Gaussian         Shape       Moyal approximation of the Landau distribution       Calculation       Image: Gaussian         Calculation       Image: Gaussian       Image: Gaussian       Image: Gaussian         Shape       Moyal approximation of the Landau distribution       Image: Gaussian       Image: Gaussian         Image: Gaussian       Image: Gaussian       Image: Gaussian       Image: Gaussian      <
Angular Straggling 1 - Moliere et al. (ATIMA 1.2)
Coefficients for GM.'s energy straggling calculations         Slope       0.217         (default 0.217)       Free member         1.12       (default 1.12)
Make default



















# Total rate is 1e+4 pps per 100 pnA





- 1. Use achromatic wedge instead homogeneous
- 2. Play more with target-wedge-slits combination for better purity
- 3. Think about a velocity filter in the proton-rich region