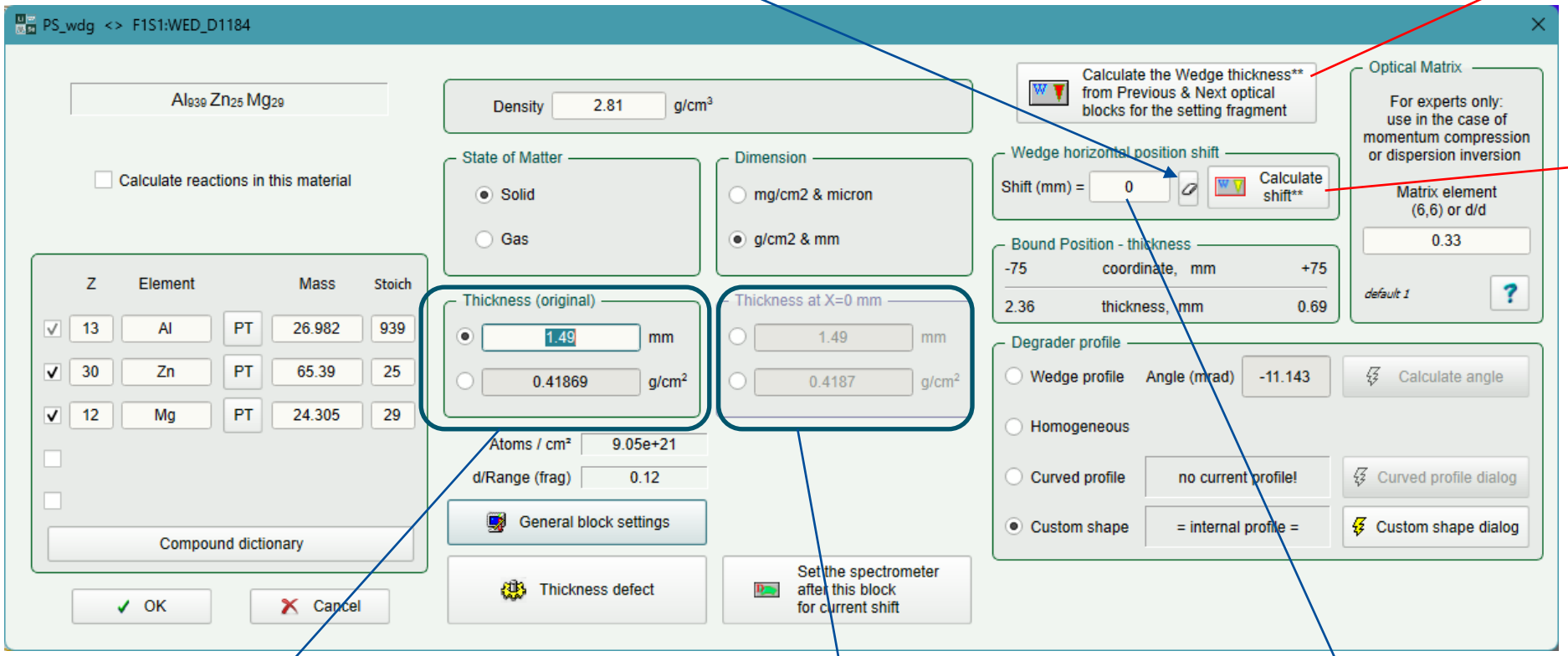
Wedge position shift

v.17.2
02/26/24

Updated v.17.4
03/27/24

Set the wedge position shift to 0



Calculate the Wedge **thickness**** from Previous & Next optical blocks for the setting fragment

Calculate the Wedge **position shift**** from Previous & Next optical blocks for the setting fragment

"Original" thickness: it is used for angle or profile shape calculations

Thickness corresponding to user position shift

Important:
Wedge shift direction in LISE is opposite to a shift in the Fragment-Separator system.

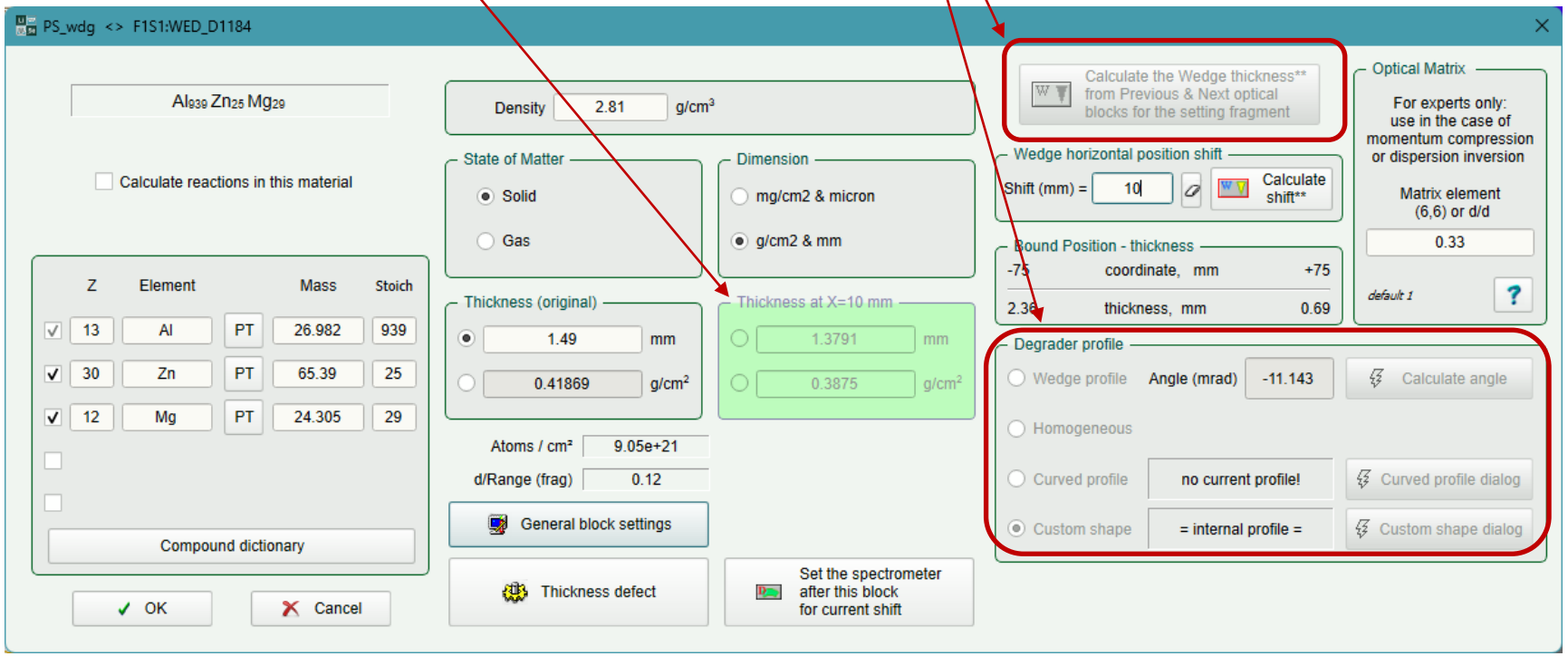
If the wedge position shift set

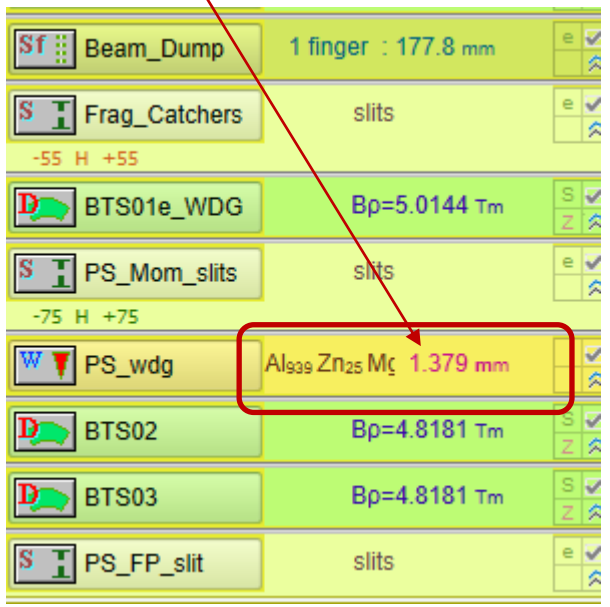
ShiftExists if abs(Shift) > 0.1 mm

This “Calculate” button and the Degrader profile frame are disable if ShiftExists

The “Thickness at **” frame get green color if ShiftExists

Wedge Thickness color in the setup window gets red-based color if ShiftExists

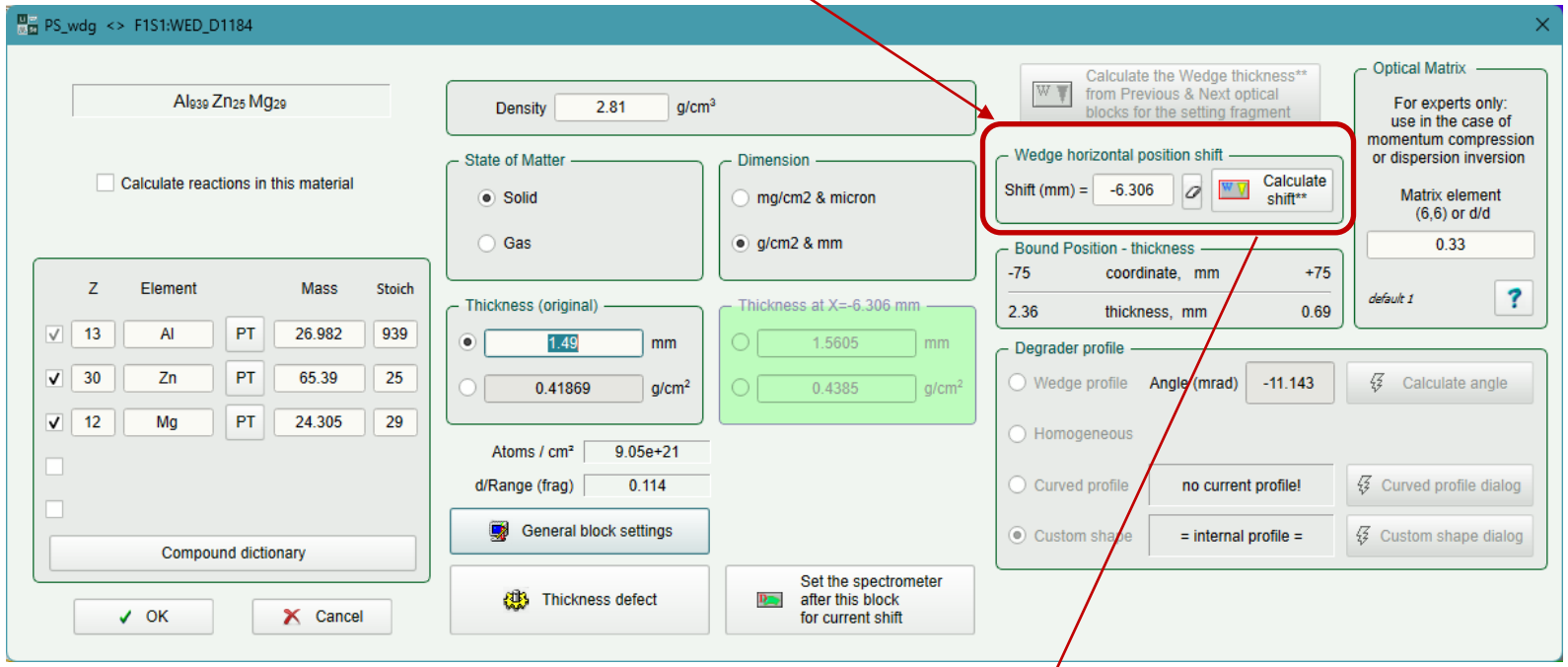


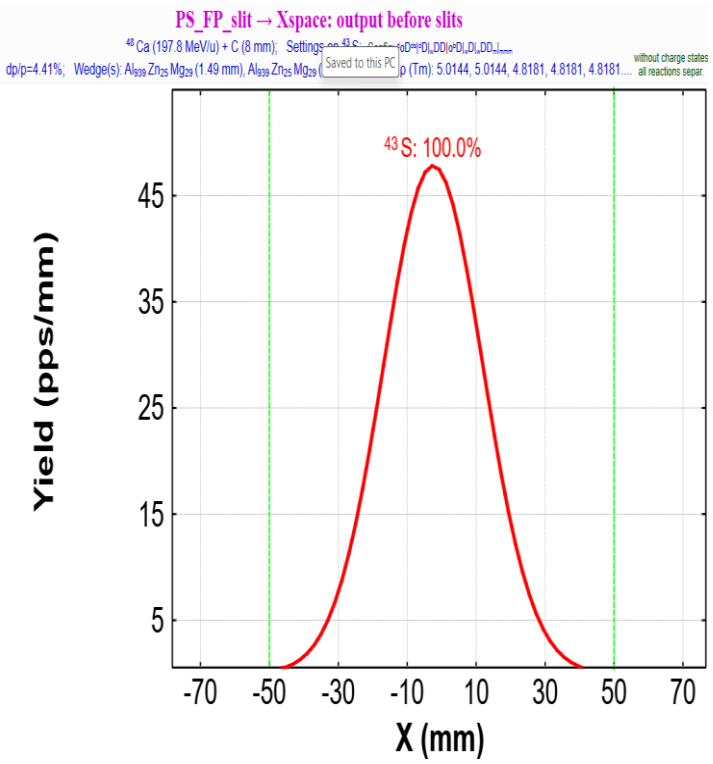


Calculate position shift

For example: the wedge has been calculated for ^{44}S, and separator has been set for ^{44}S.
But you would like to keep optics settings (Bρ-s), but optimize the current wedge for ^{43}S production.
Change FOI to ^{43}S, then calculate a position shift. Result -6.306 mm.

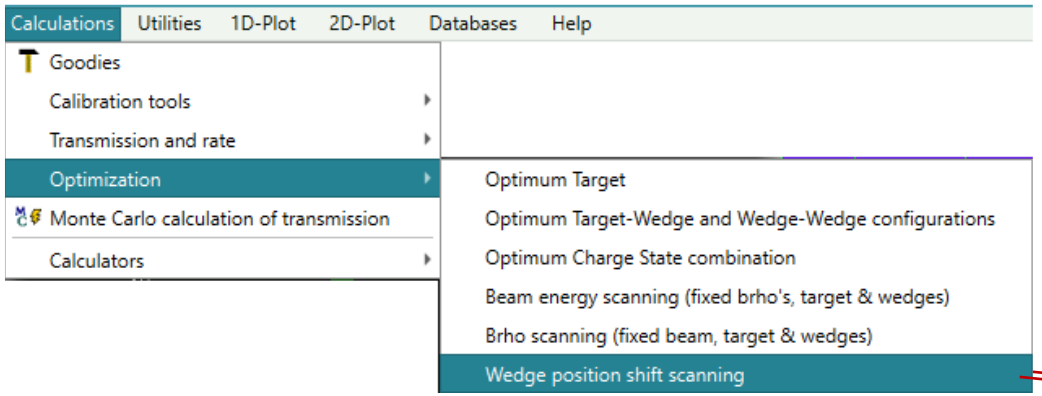
Therefore, you have to shift the wedge on +6.306 mm to get ^{43}S at PS_FP_x=0



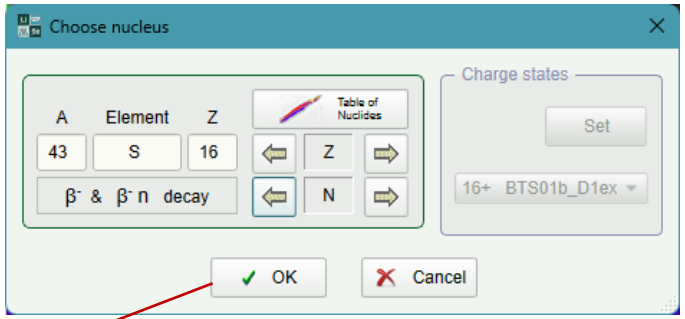


Calculate the Wedge **position shift**** from Previous & Next optical blocks for the setting fragment

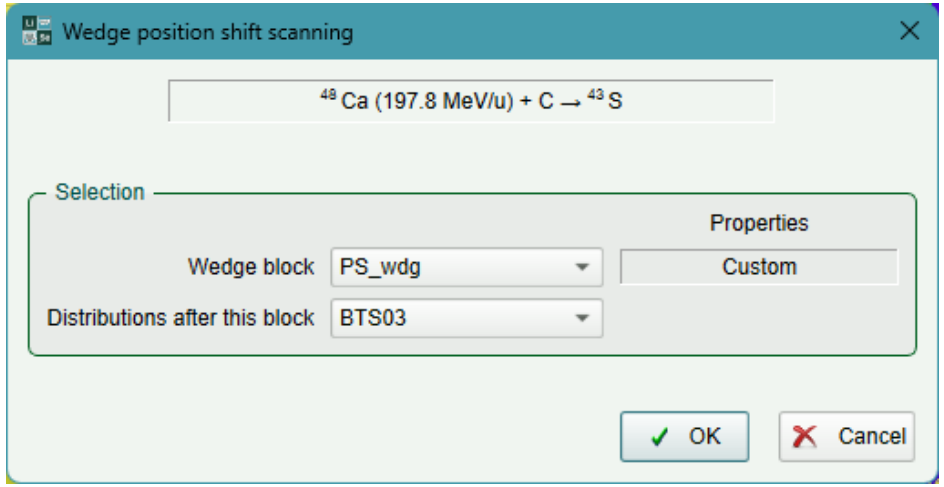
Wedge position shift scanning utility



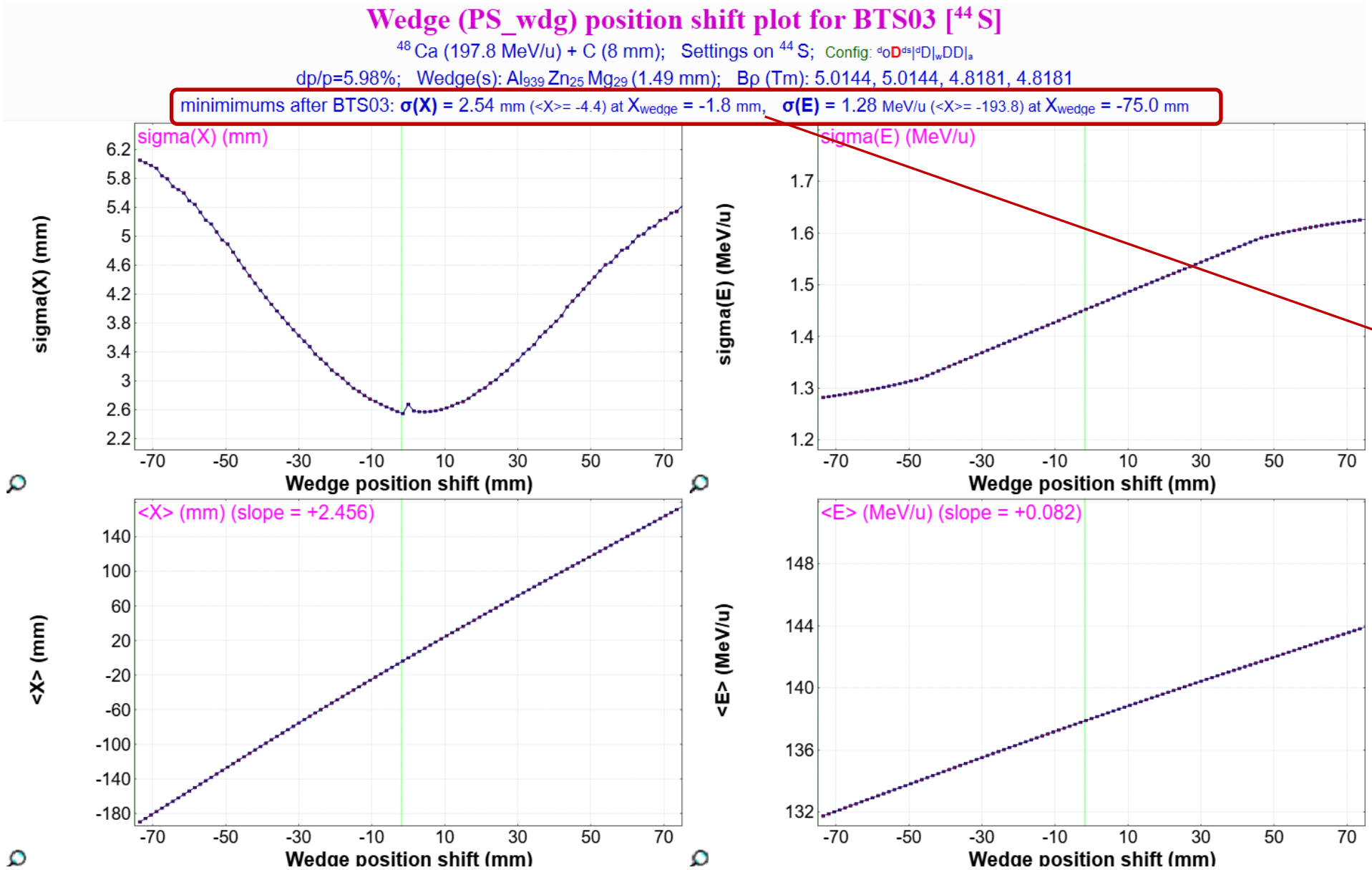
Choose nucleus.
For example: ^{43}S,
Thought FOI is ^{44}S



Then Choose wedge and destination blocks



Wedge position shift scanning utility



It shows, that minimum size corresponds to zero shift.

It is possible to see how spatial and energy spread are sensitive from wedge position in the case of ARIS.

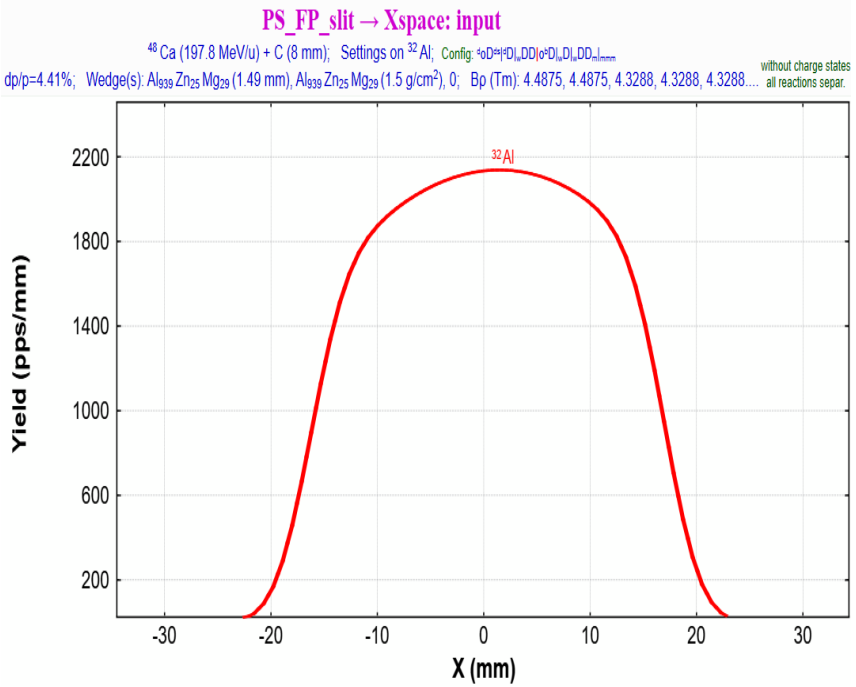
Energy and spatial widths are correlated!!

Wedge position shift scanning utility: application task

Task:

- there is only one high order wedge calculated for ^{44}S (Bρ=5.0144 Tm)
- It is necessary to obtain a ^{32m}Al beam
- How to provide high purity of this beam, or by other words to have it achromatic is PS_FP ?
- Is it possible to realize it with a wedge position shift?

LISE ^{32}Al settings (Bρ1 = 4.4873)



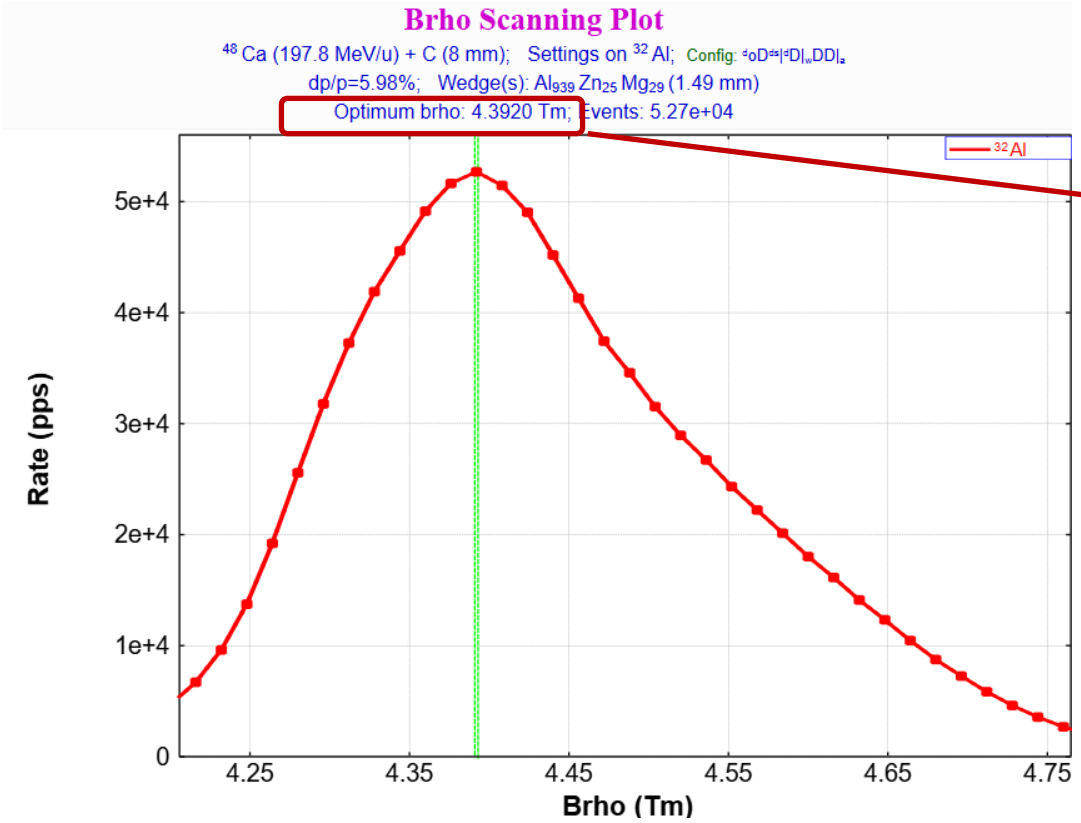
Bρ1	Tm	σ(X) mm @ PS_FP no shift	σ(X) mm @ PS_FP with shift	Wedge position shift
-2%	4.3975	7.7	-40	3.5
optimal	4.4873	9.5	-50	6.5
+2%	4.577	14	-50	11.2

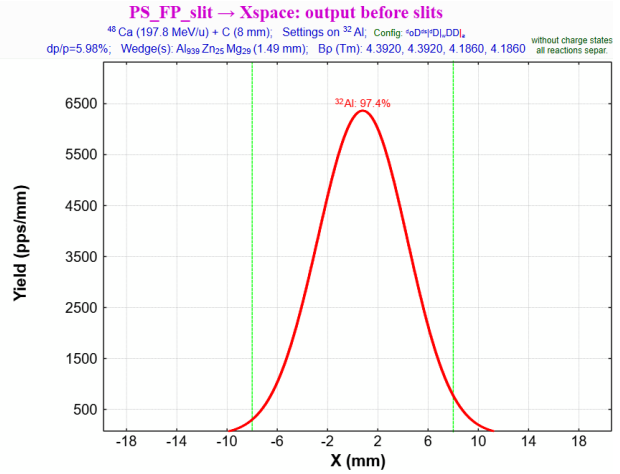
It's not a optimal way using this utility with iterations …..
Check the next slide for solution for this task

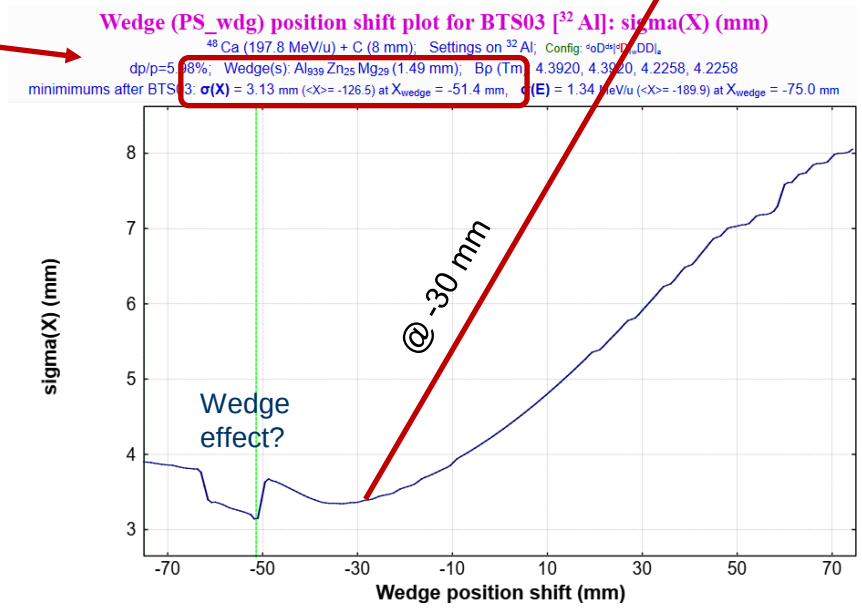
Re-using a wedge for another fragment of interest

Task:

- there is only one high order wedge calculated for ^{44}S (Bρ=5.0144 Tm)
- It is necessary to obtain a ^{32m}Al beam
- How to provide high purity of this beam, or by other words to have it achromatic is PS_FP ?
- Lets use the narrow slits at PS_FP with following faraday cup
- The **Brho scanning utility** tells Brho value which corresponds to smaller X-distribution size







Modifications v.17.0 - 17.2

17.0.1 01/12/24 Typos correction from Kenny

17.0.2 01/26/24 LISE tutorial version 2

17.0.3 01/31/24 correction in BI-code (bug fixed with output file)

17.0.4 02/05/24 update of eC_ARIS_k3cb2.lpp for official names

17.0.5 02/09/24 isomer DB has been updated by DK for Kameda PRC paper

17.0.6 02/09/24 **bug with mass excess cells in Kinematics Calculator**

17.0.7 02/09/24 extern W_ME was modified everywhere for DefaultMassOption

17.0.8 02/09/24 new isotope discovery 2023 were updated

17.1.0 02/09/24 middle version has been changed

17.1.1 02/22/24 Fissile --> Fissioning in text and menu

17.1.2 02/24/24 Modification of the wedge dialog to the wedge shift

17.1.3 02/24/24 BLOCK_Wedge.h: new parameter "wedge_shift"

17.1.4 02/24/24 modification of config read/write for new parameter "wedge_shift"

17.1.5 02/24/24 p_BLOCK_Wedge.cpp: update of GetThicknessWedge and GetThicknessWedgeFromAngle for new parameter "wedge_shift"

17.1.6 02/24/24 Modification of the wedge dialog to the wedge shift : done

17.1.7 02/24/24 Brho Calculation for wedge with shift

17.1.8 02/24/24 wedge shift -- now inverse

17.1.9 02/24/24 wedge shift -- scan utility preparation

17.1.10 02/24/24 UNREFERENCED_PARAMETER in BLOCK_Compound

17.1.11 02/25/24 correction with calibration-name in config-writing

17.1.12 02/25/24 creation of the d_Scanning_wedgePostion dialog

17.1.13 02/25/24 new distribution function min_i777()

17.1.14 02/25/24 new utility CmWedgePositionScanning()

17.1.15 02/25/24 CmWedgePositionScanning() : sigmaE and positionE added

17.2.0 02/25/24 middle version changed