********** Yields expected at ALTO **********
*
Yields in the target have been obtained from Fluka calculations performed in the frame of the Fluka2020 version 0.3 using a UC2 target with 13 mm diameter, 6 cm length and 3.82 g/cm3 density and 6E8 incident electrons of 50 MeV energy.
Independent and cumulated yields are then normalized to a 10 µA electron beam.
In the previous version of FLUKA (FLUKA_2011) used in ref. 1, the number of fissions calculated in the target was underestimated by a factor of 7.5 due to the underestimation of the photon flux (factor ~ 1.9) and of the photofission cross sections (factor ~ 3.9).
In the new version, the cross sections have been corrected but there is still an underestimation of the number of fissions calculated in the target due to the photon flux.
Calculations performed with Fluka versions 2021 (Fluka version 4-1.1 by CERN or Fluka2021 version 2.1 by P.R. Sala) give very similar results to those obtained with Fluka2020.
Since Fluka gives results as a function of A and Z, without specifying which state (groundstate or isomeric state) is formed, only the groundstate is assumed to be produced.
*
Yields out of the target were calculated from the estimated in-target yields corrected from release and ionisation efficiencies.
"The 39 ≤ Z ≤ 46 elements have a melting point above 1500 °C, they are considered refractory and do not leave the target. For Ni, As, Sb and Ln, the yields out of the target are not calculated due to lack of available release time. "
For the other elements, the release times and the main phenomenon involved in the release are those determined either directly (release time measurement) or indirectly (by comparison between the yields in the target and those measured after separation) [refs.2-3].
"Ionisation efficiencies, for an MK5 ion source, were also obtained in the analysis comparing the yields in the target with those measured after separation [refs. 2-3]. "
The ionisation efficiencies for a surface ionisation ion source were calculated for a W source at 2000 °C.
*
The yield measurements were carried out with a 50 MeV electron beam of 10 µA intensity, except during the 2006 experiment where the beam intensity was limited to 100 nA [ref.4].
*
*
References :
1. J. Guillot et al., NIM B 466 (2020) 1-7
2. B. Roussière et al., NIM B 194 (2002) 151-163
3. B. Roussière et al., NIM B 246 (2006) 288-196
4. M. Lebois, Thèse, Université Paris-Sud (2008)
*
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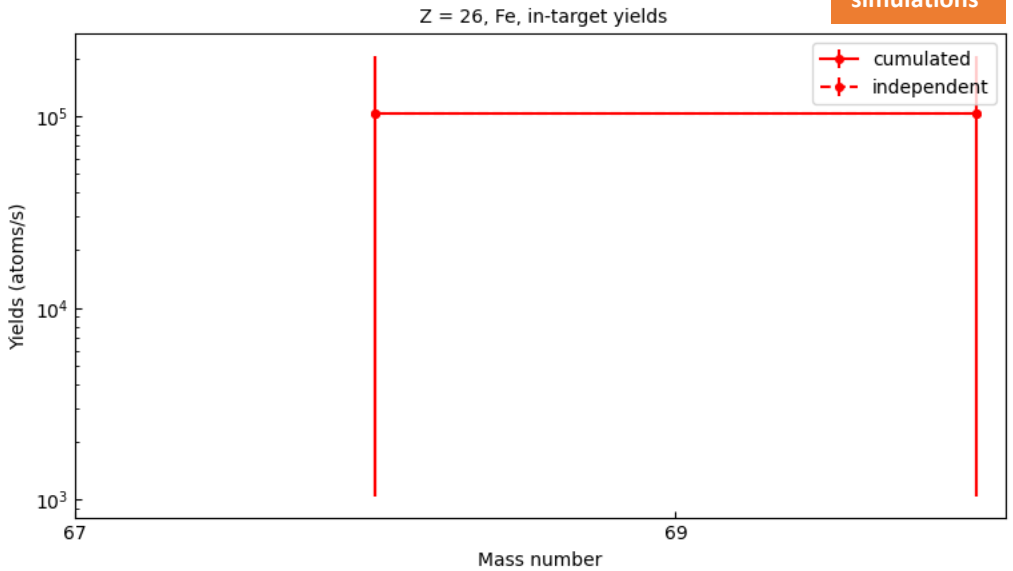
Parameters used to estimate the yields available at ALTO

Element	Z	release time (s)	process	eff_IS_W (%)	eff_IS_Ta (%)	eff_MK5 (%)
Cu	29	32	effusion			8.8
Zn	30	5.4	effusion			9.7
Ga	31	2.3	effusion	0.029	0.007	3.6
Ge	32	120	effusion			2
Se	34	674	effusion			0.14
Br	35	147	diffusion			5.3
Kr	36	11	diffusion			5.2
Rb	37	58	diffusion	75.854	41.683	2.4
Sr	38	583	effusion	0.561	0.128	2.7
Ag	47	3.2	effusion			7.5
Cd	48	48	effusion			7.2
In	49	2	effusion	0.085	0.019	1
Sn	50	55	effusion			3
Te	52	240	effusion			10
I	53	19	diffusion			9.6
Xe	54	21	diffusion			5.6
Cs	55	140	diffusion	93.260	75.854	1.2
Ba	56	1200	effusion	6.139	1.466	10

simulations



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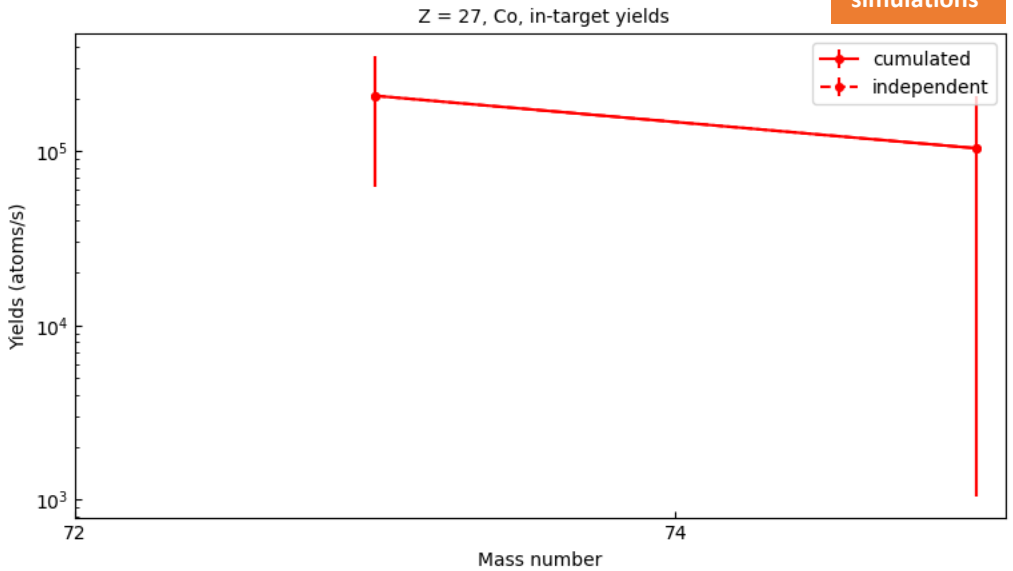

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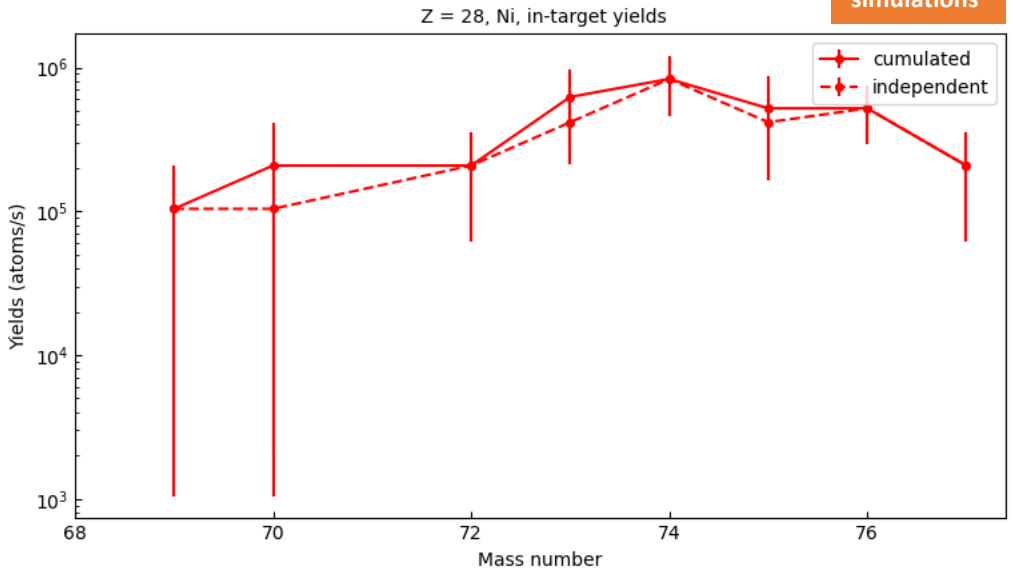

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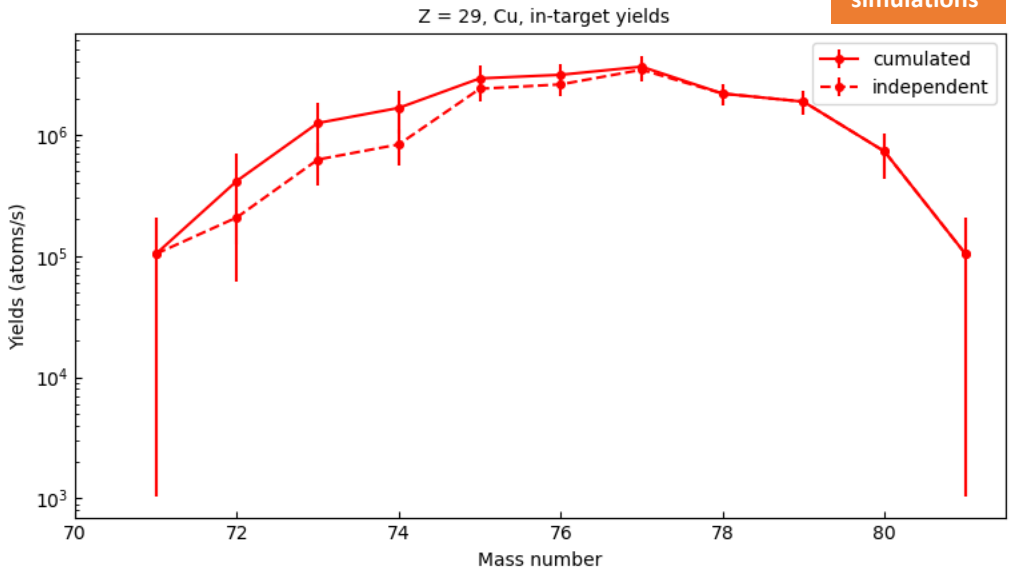

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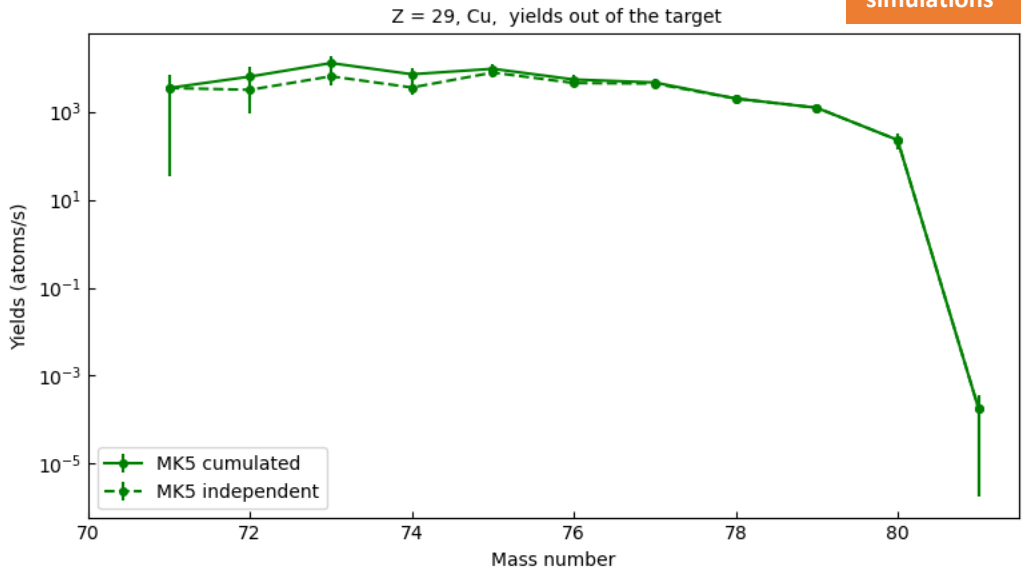

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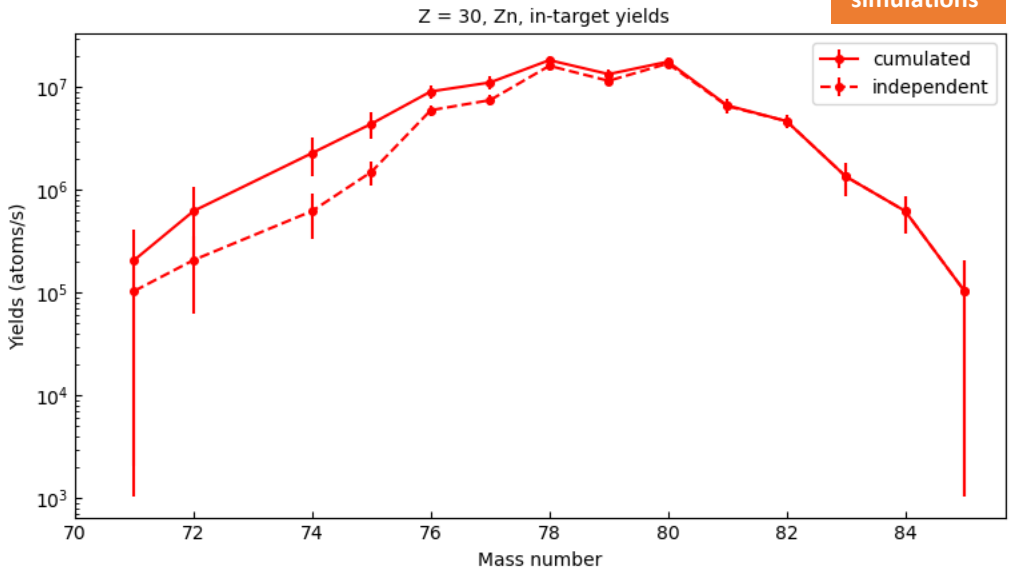

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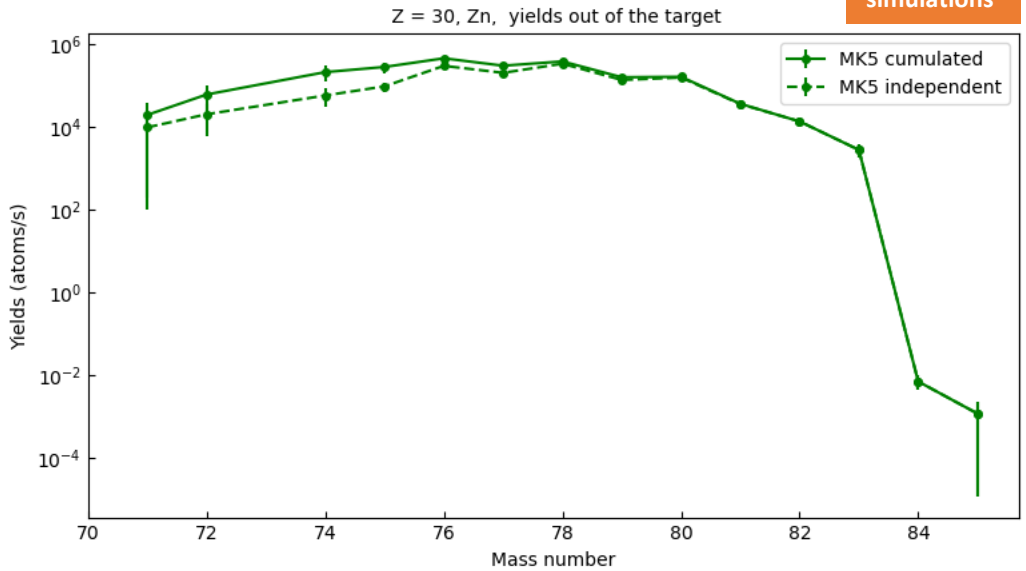

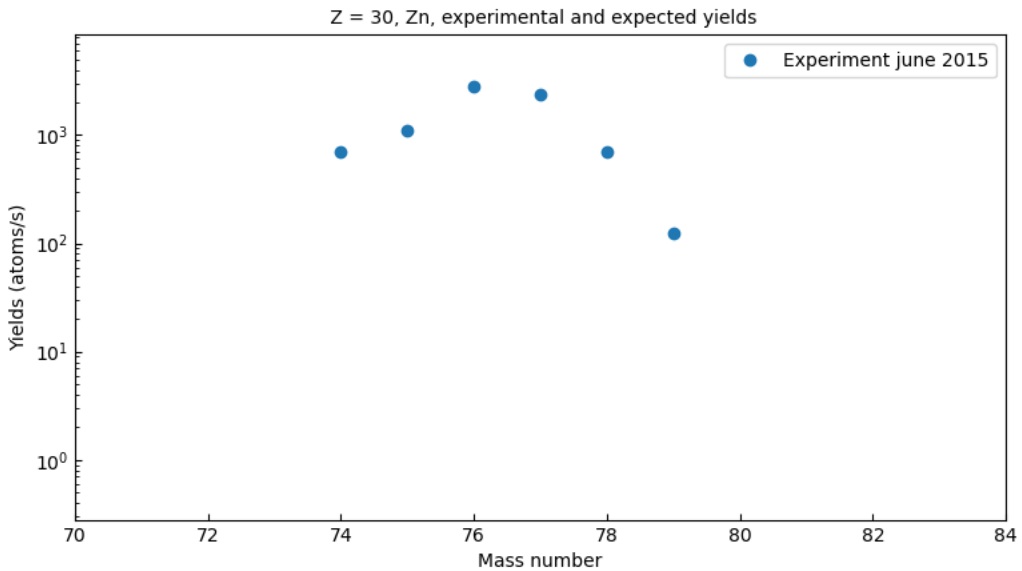

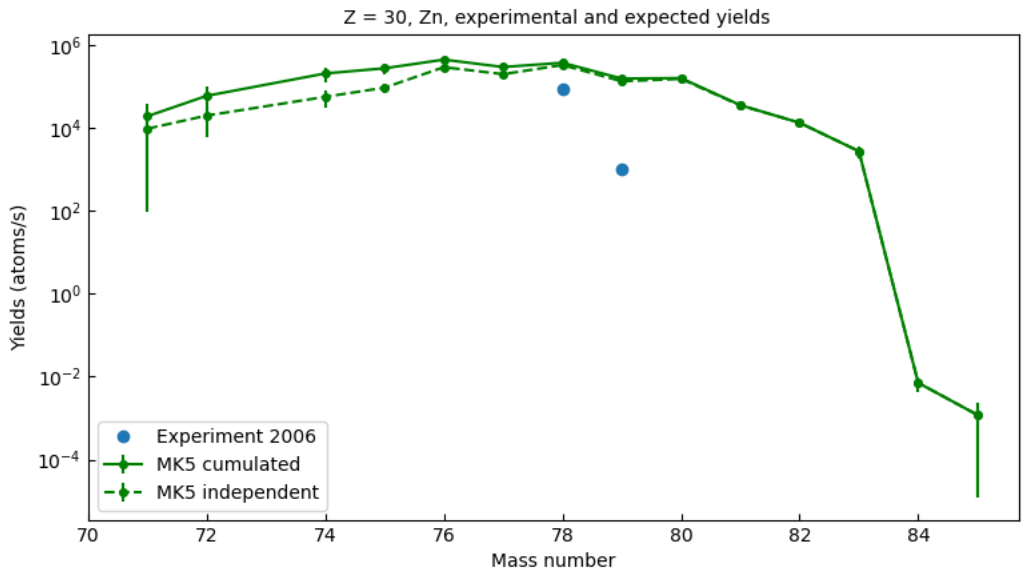

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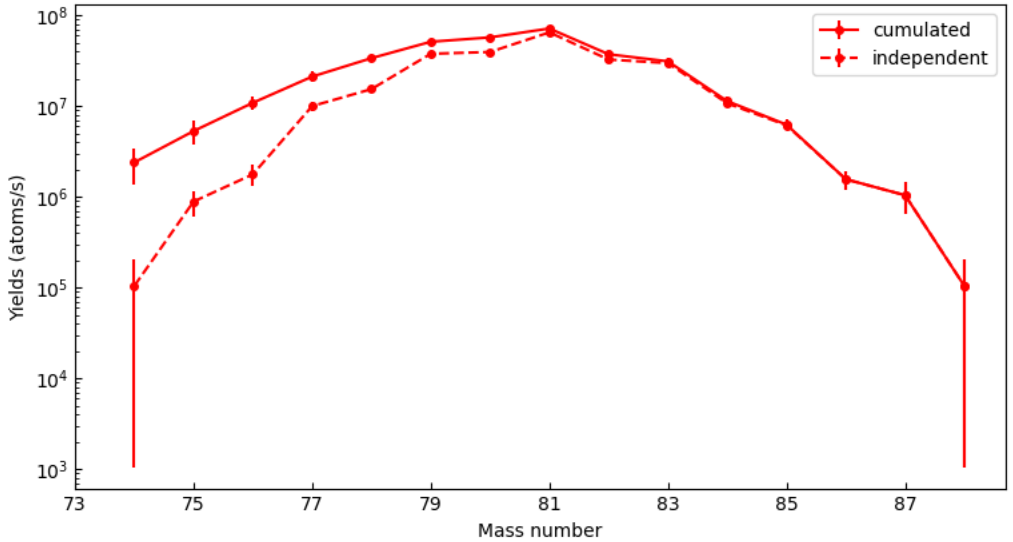

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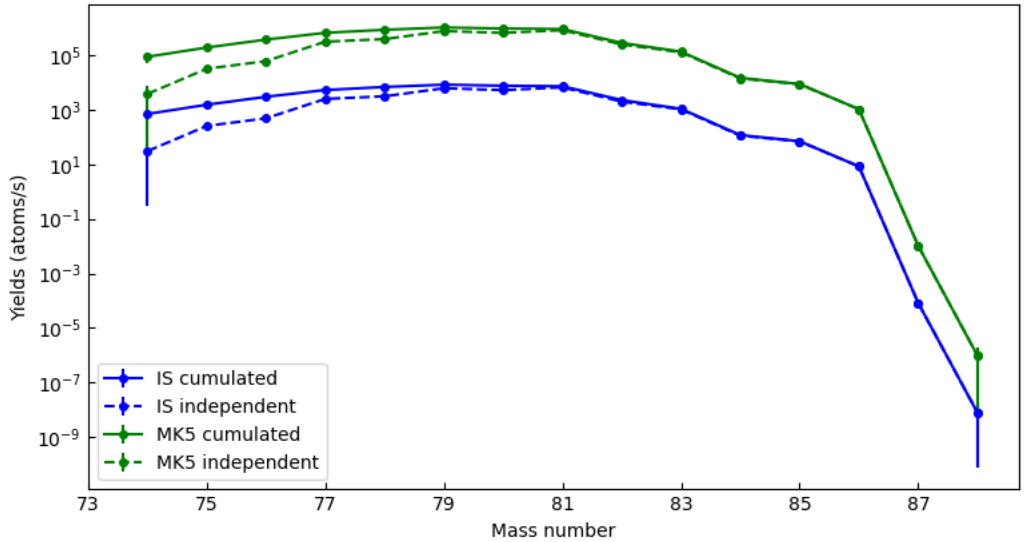

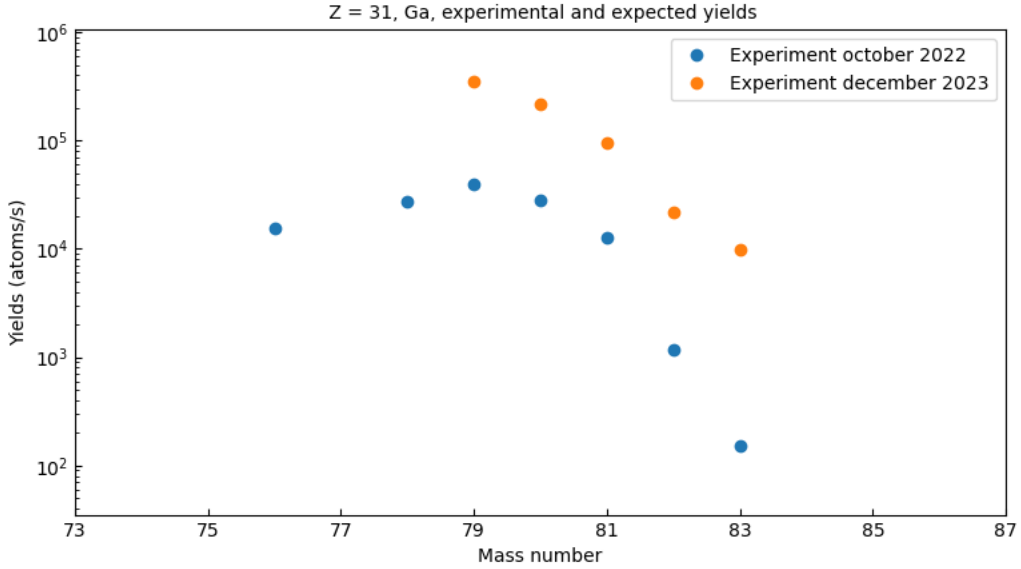

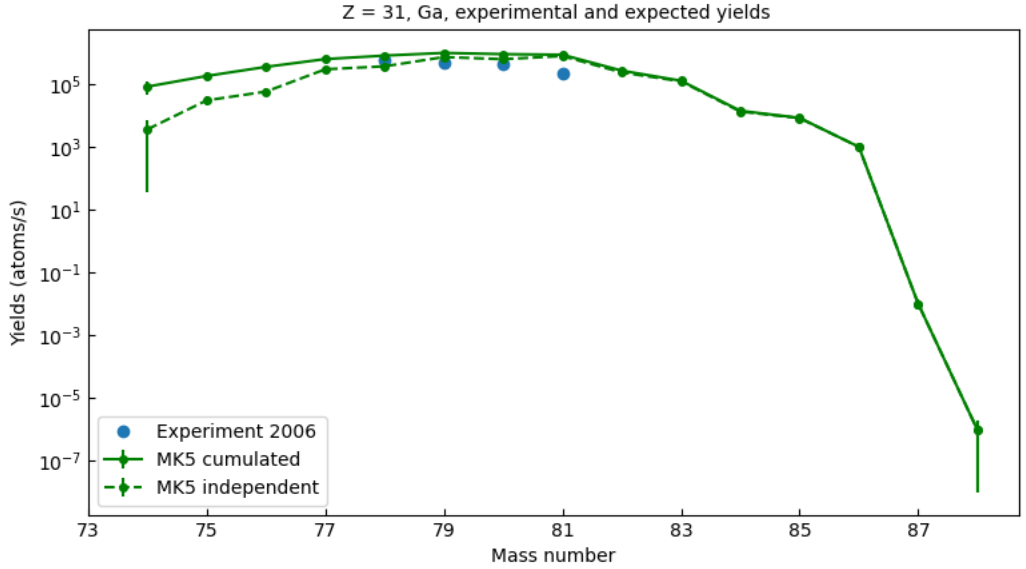

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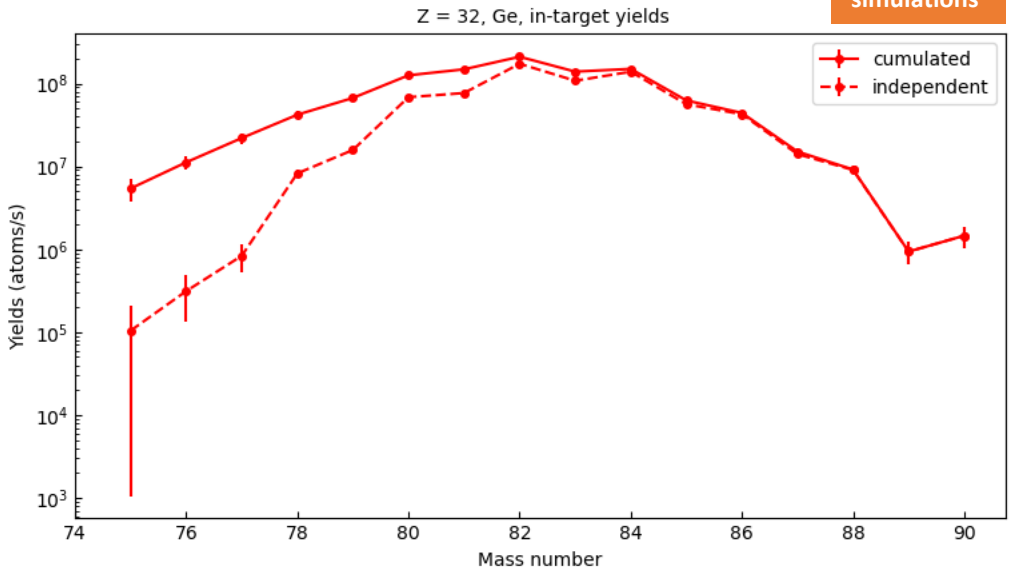

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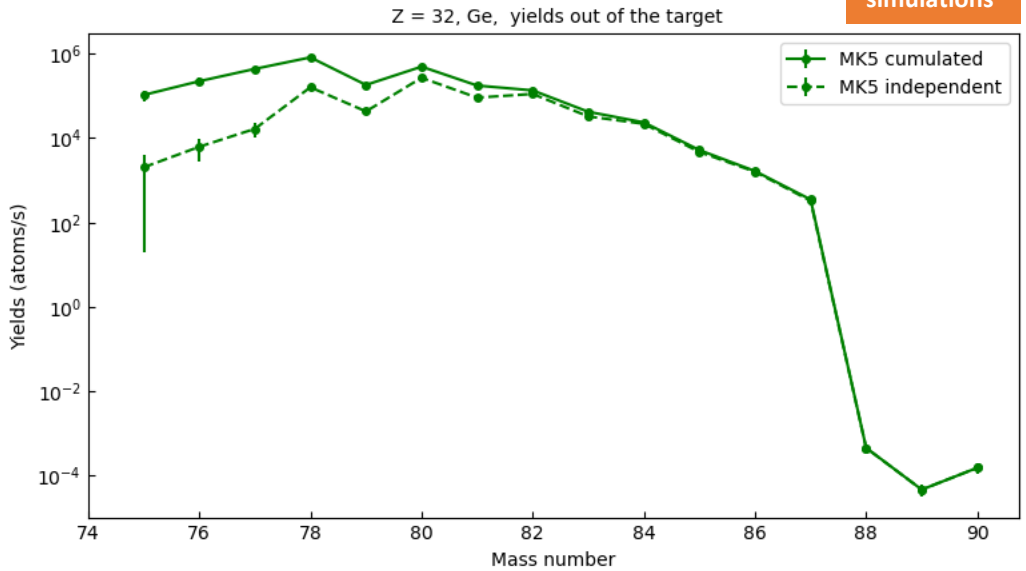

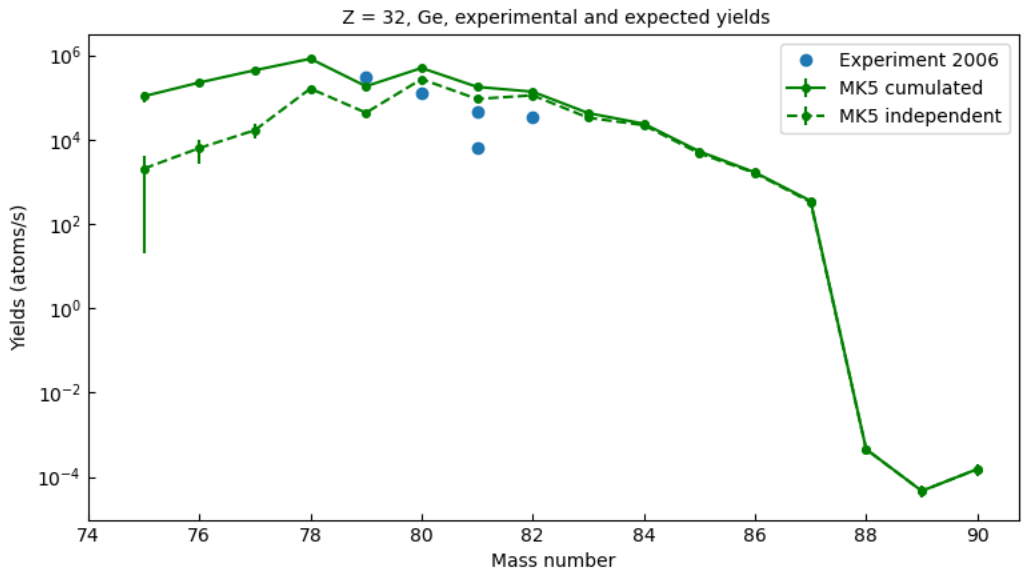

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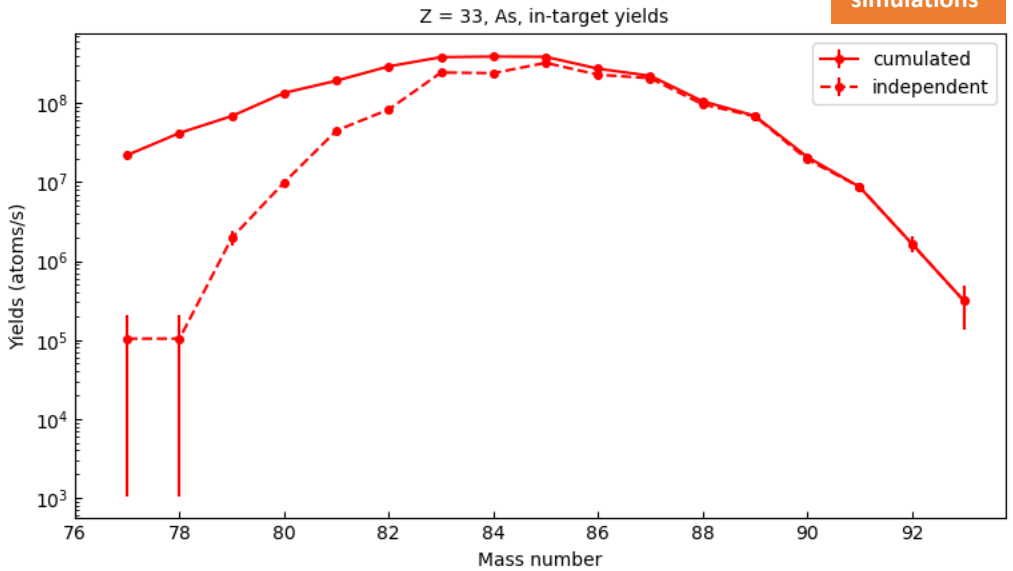

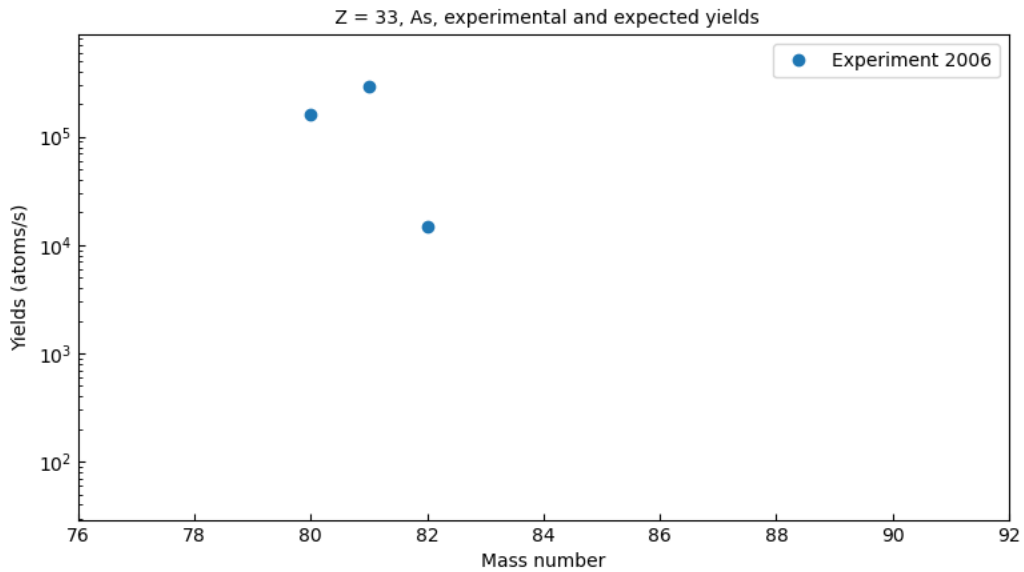

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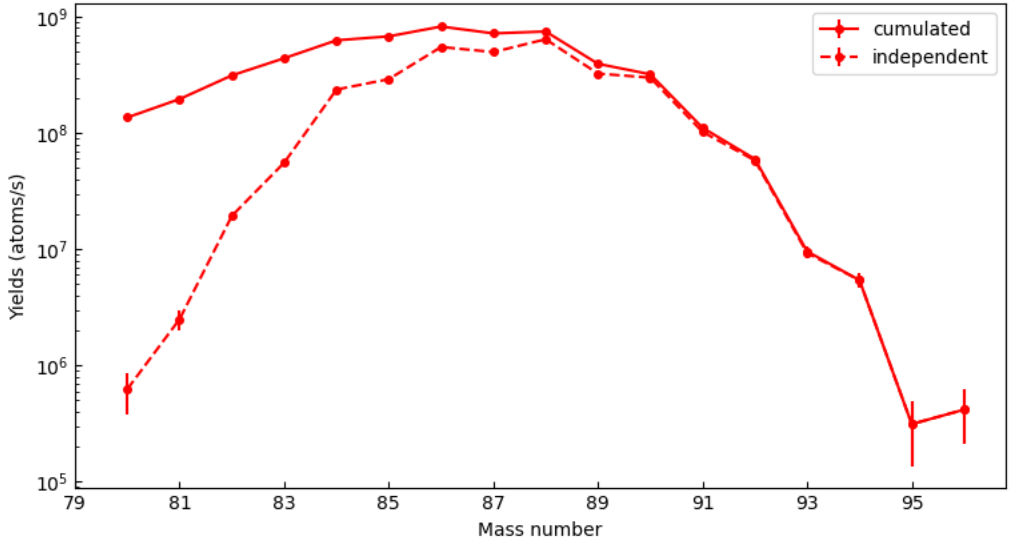

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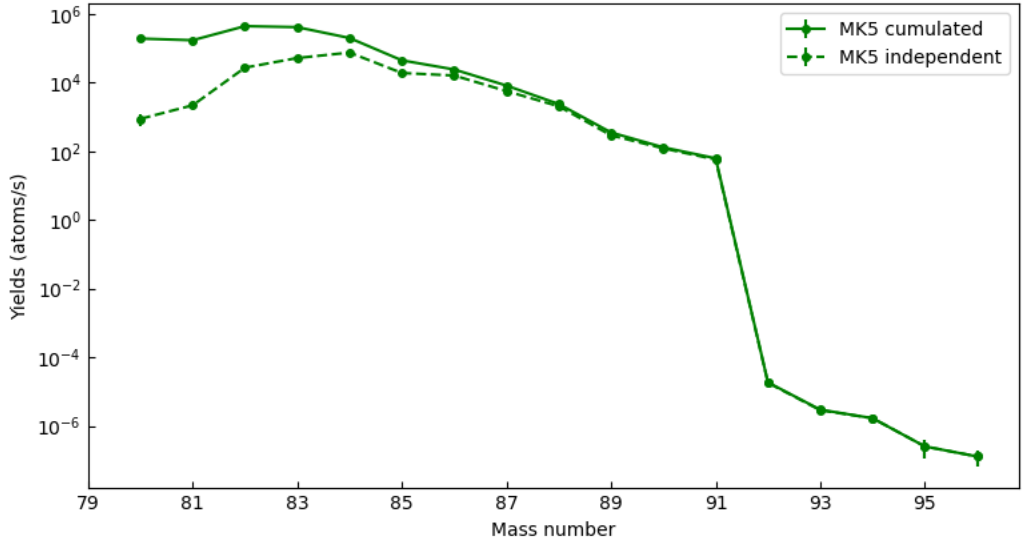

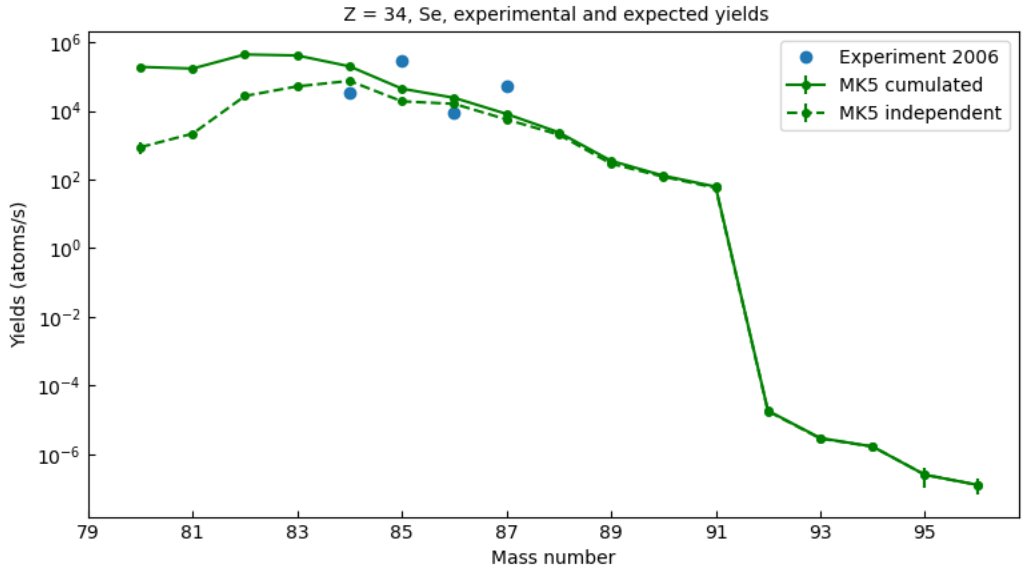

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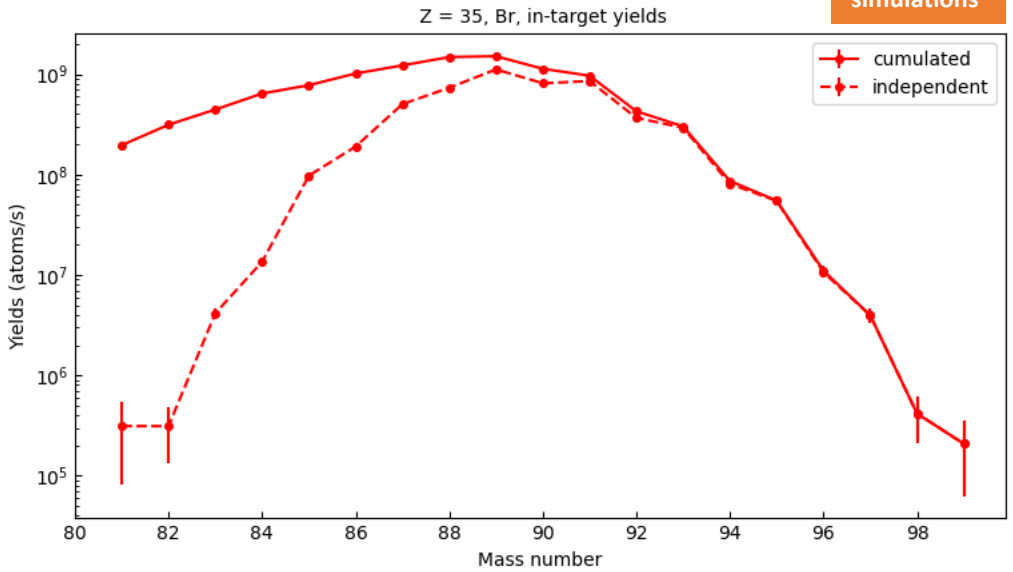

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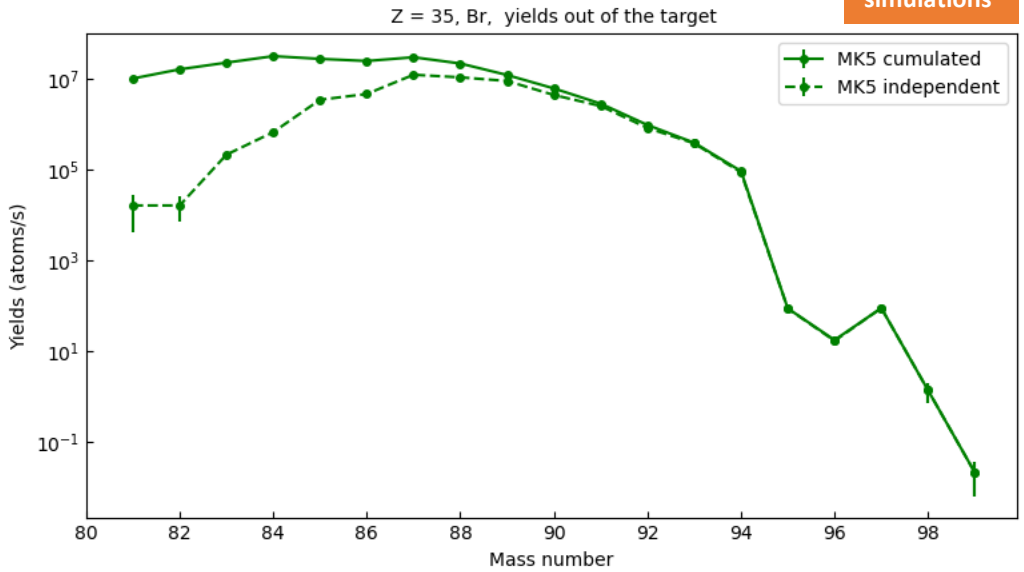

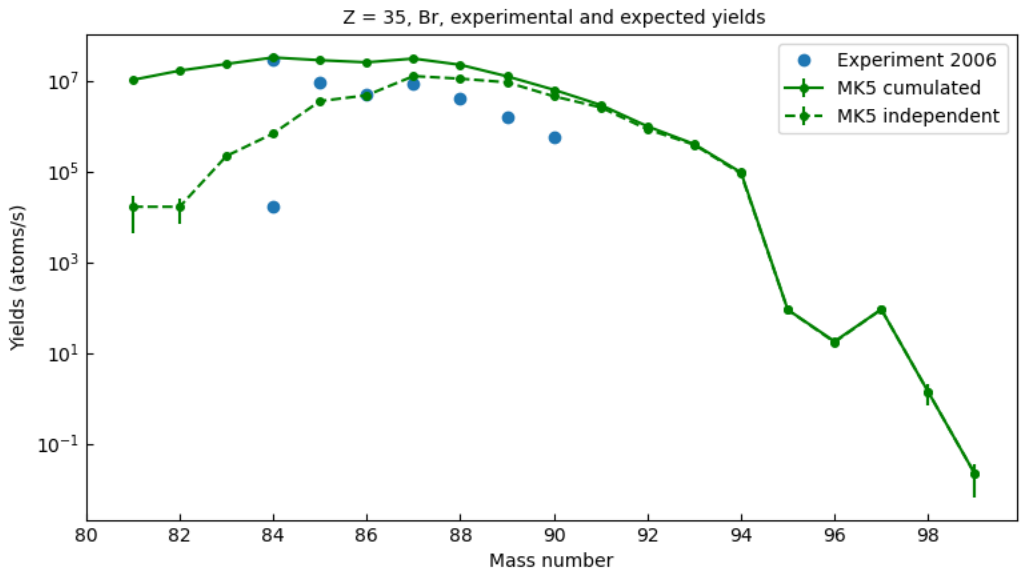

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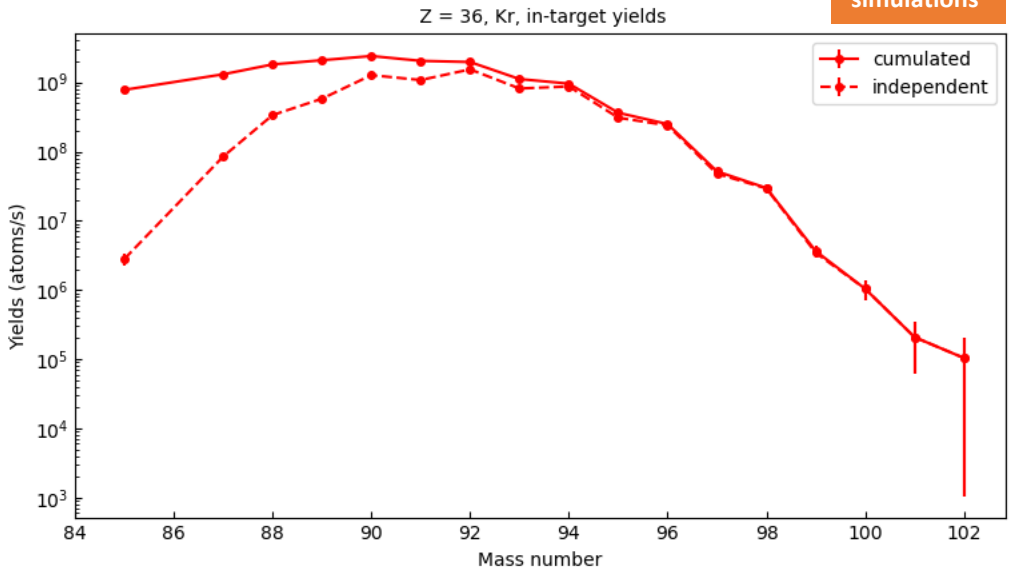

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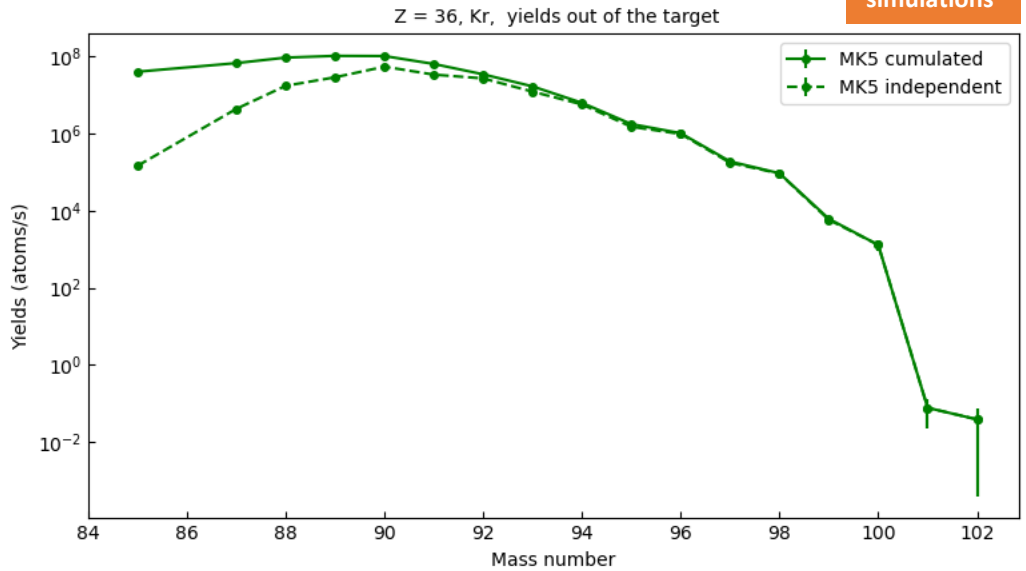

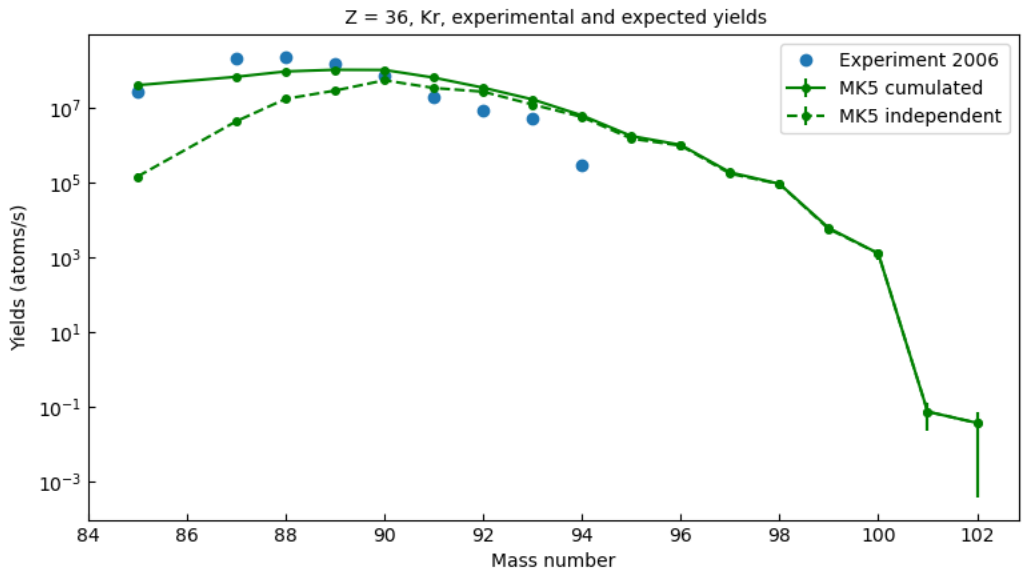

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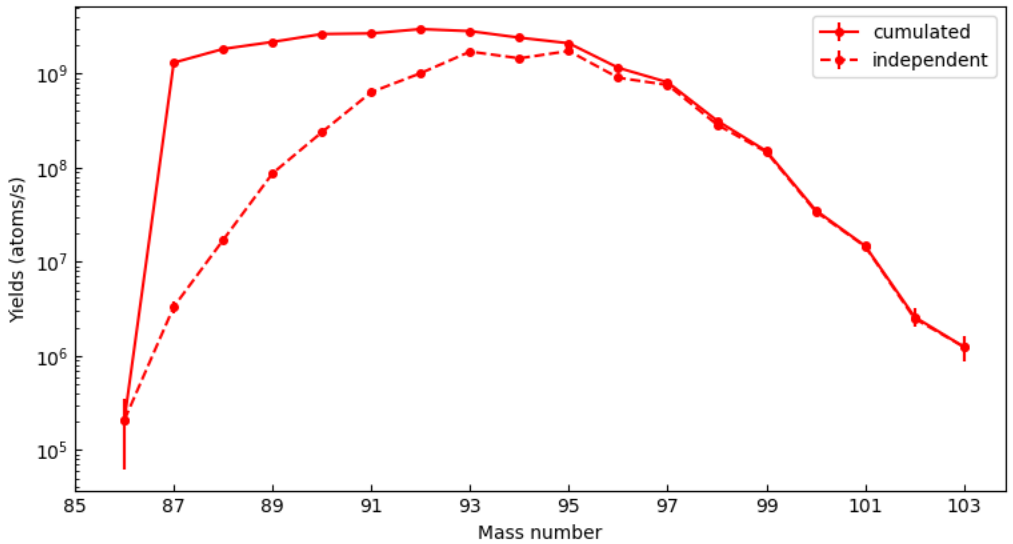

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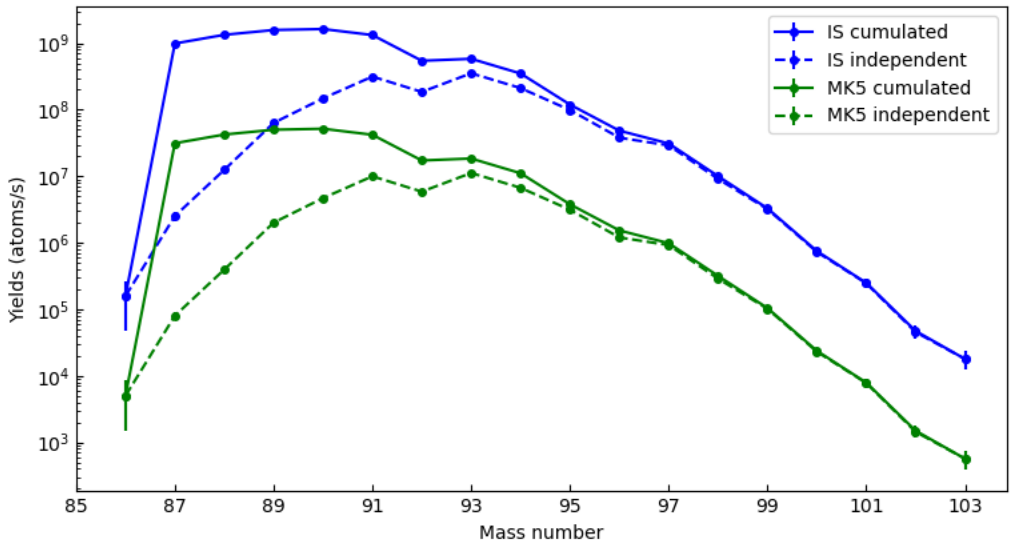

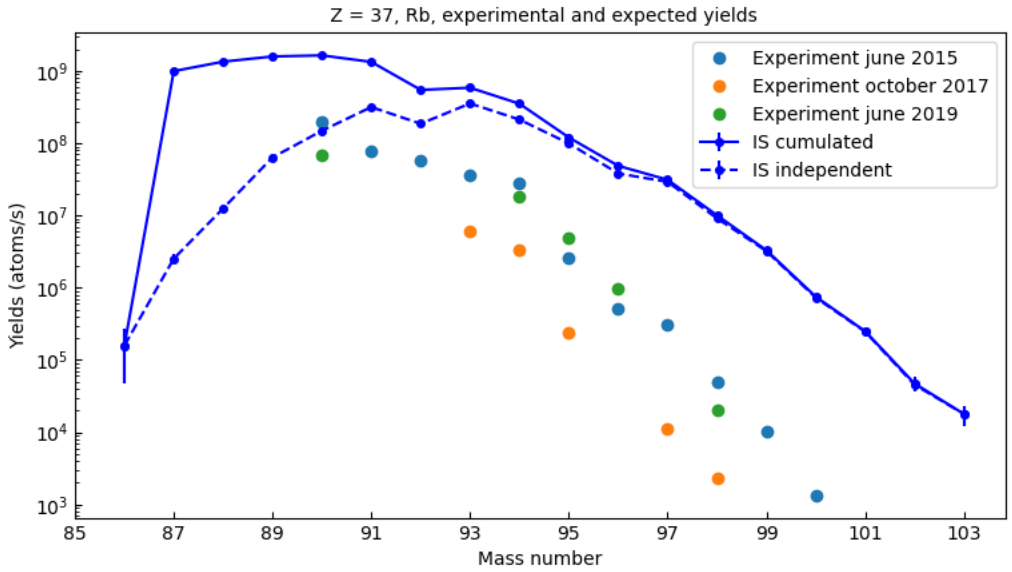

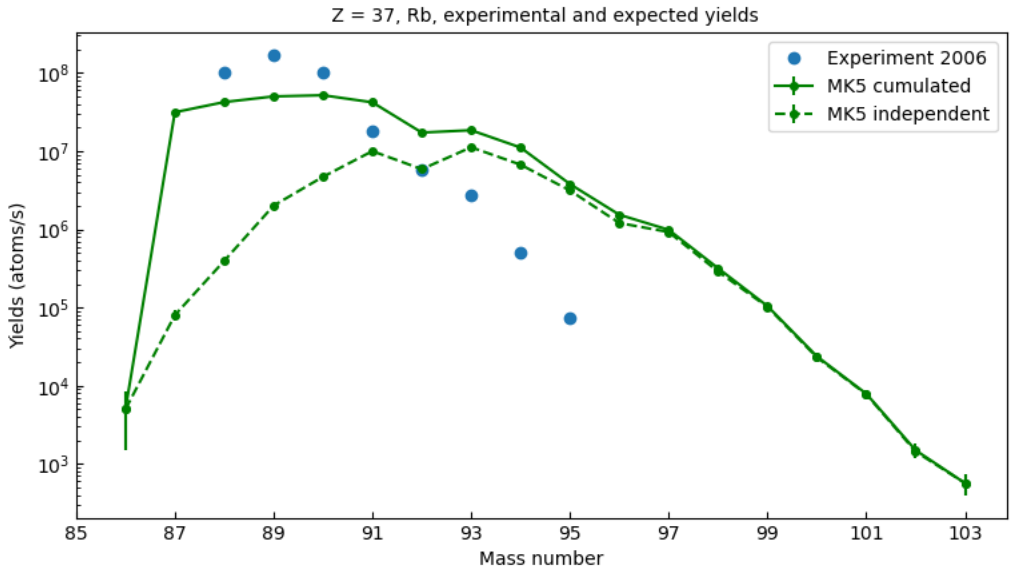

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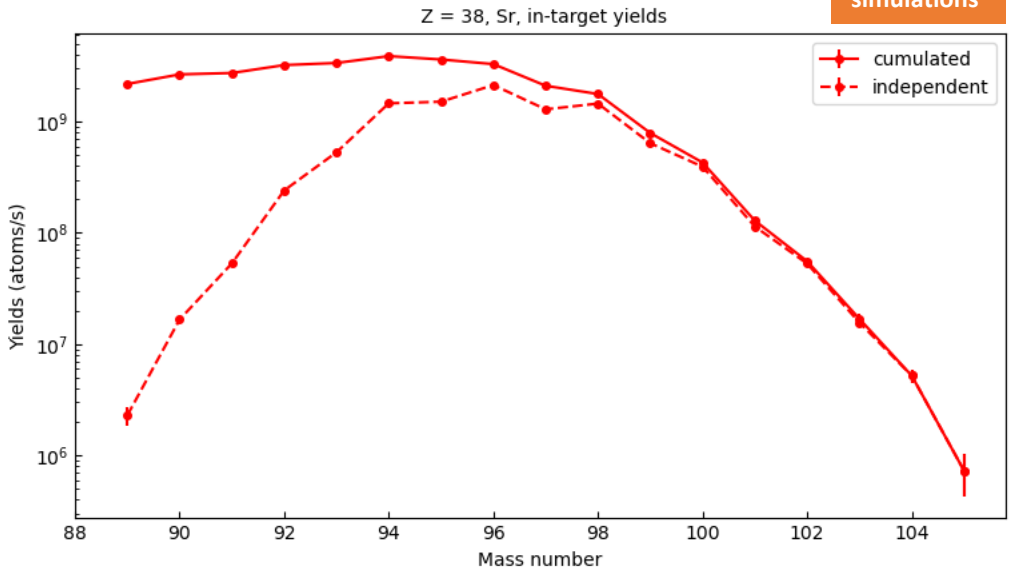

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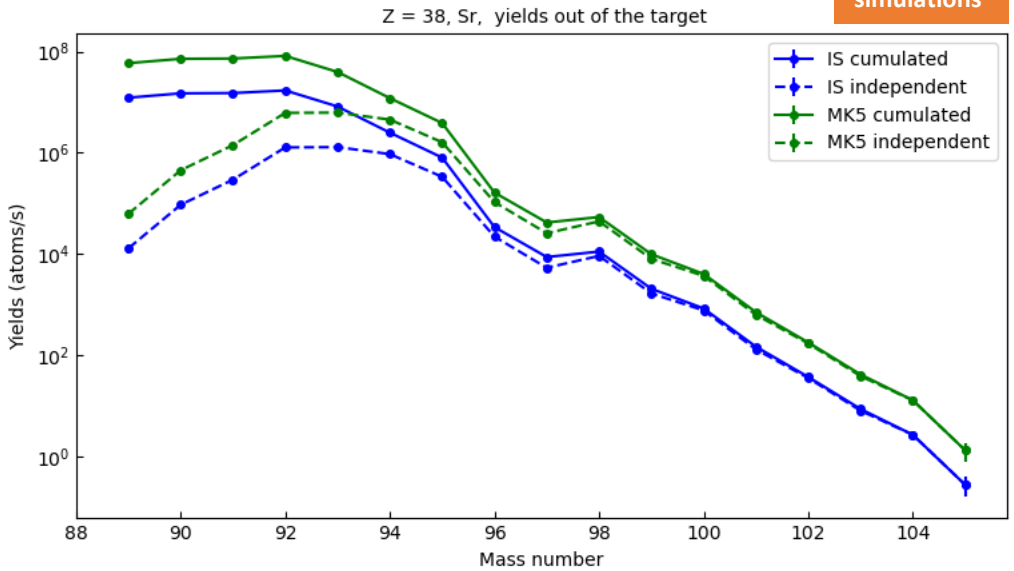

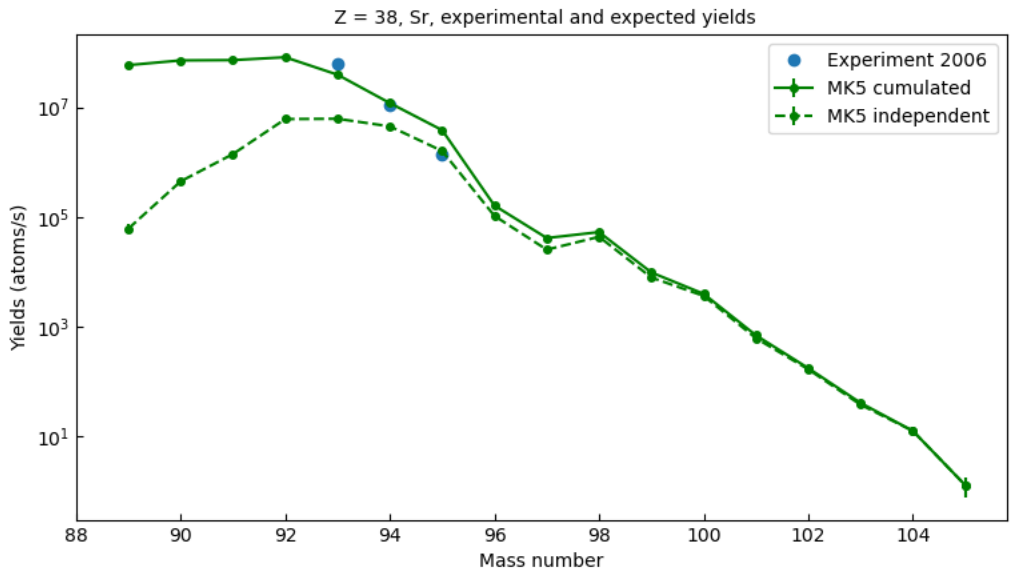

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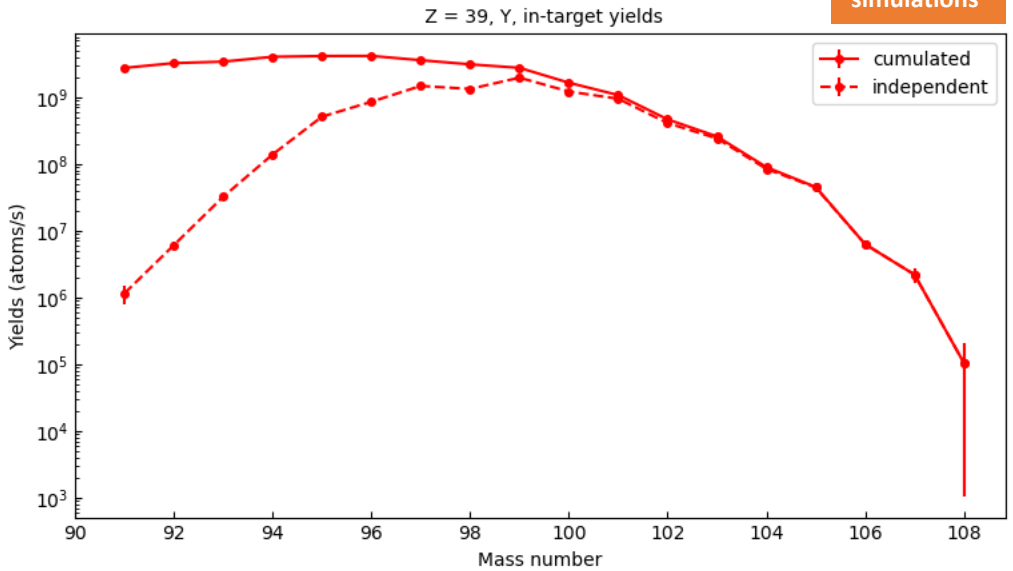

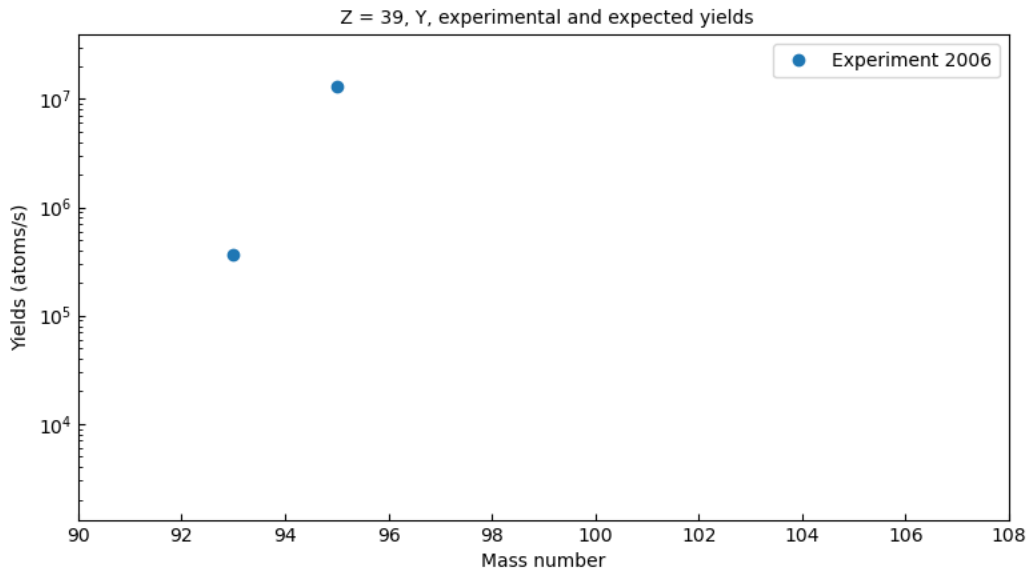

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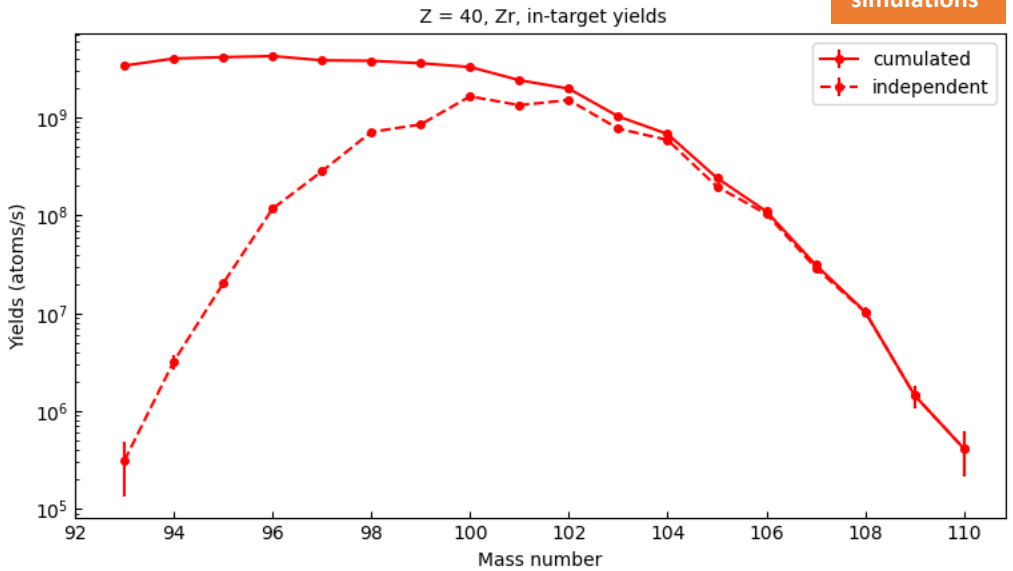

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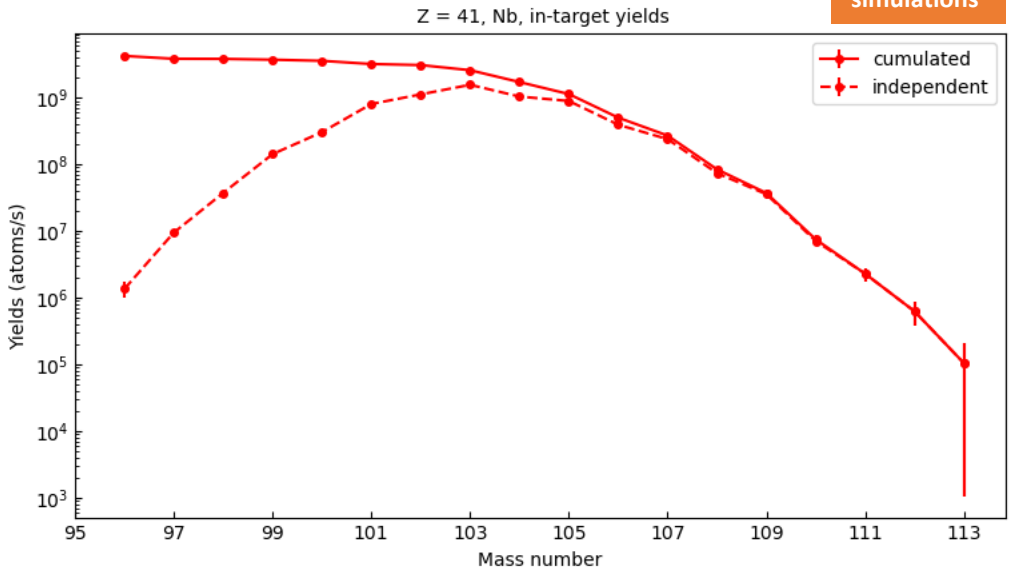

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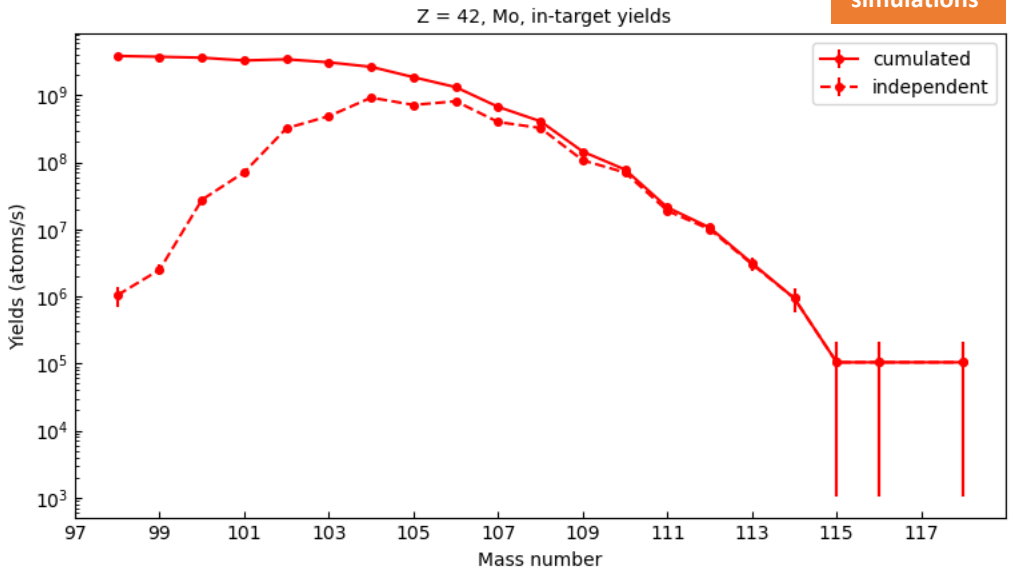

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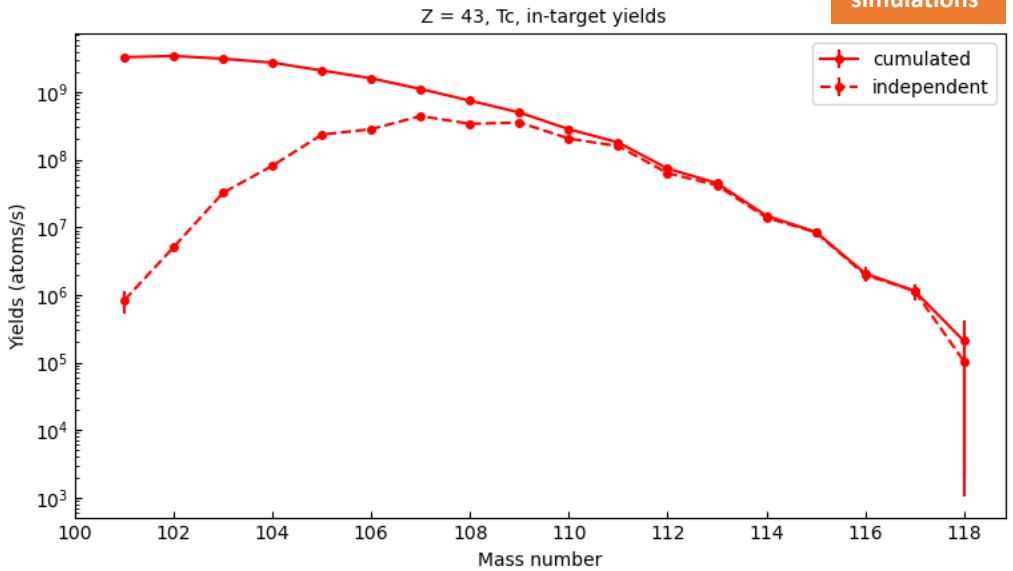

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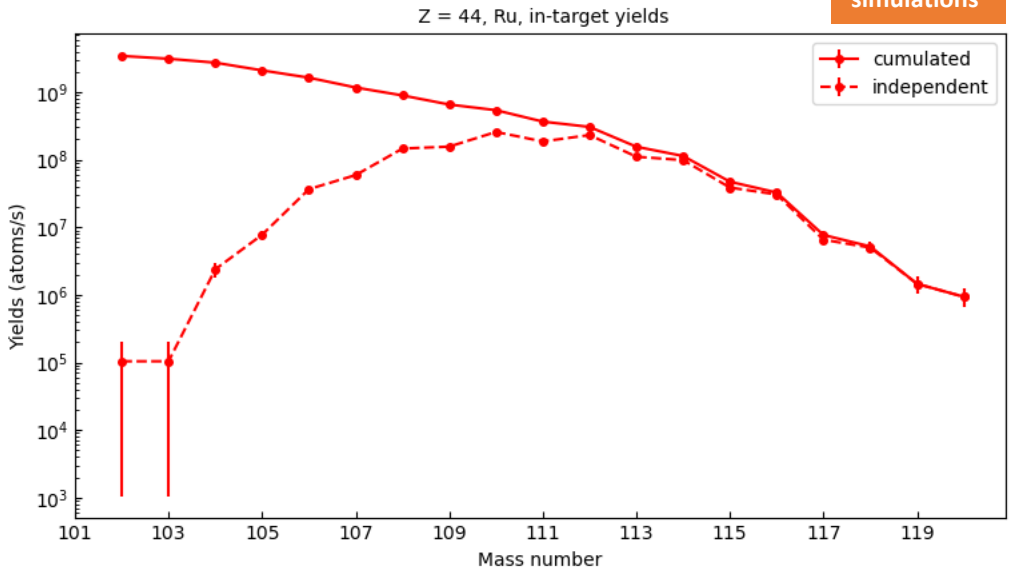

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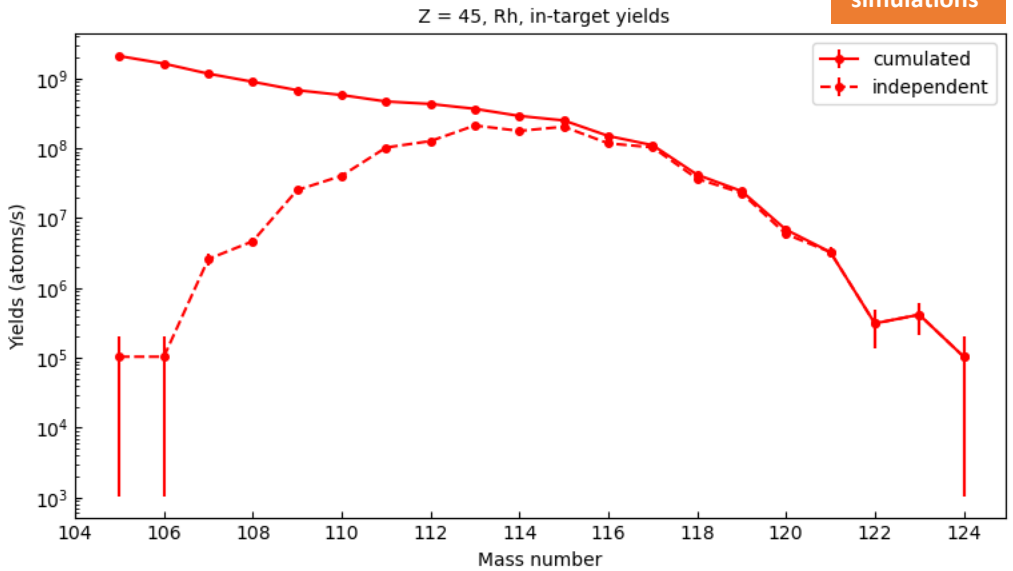

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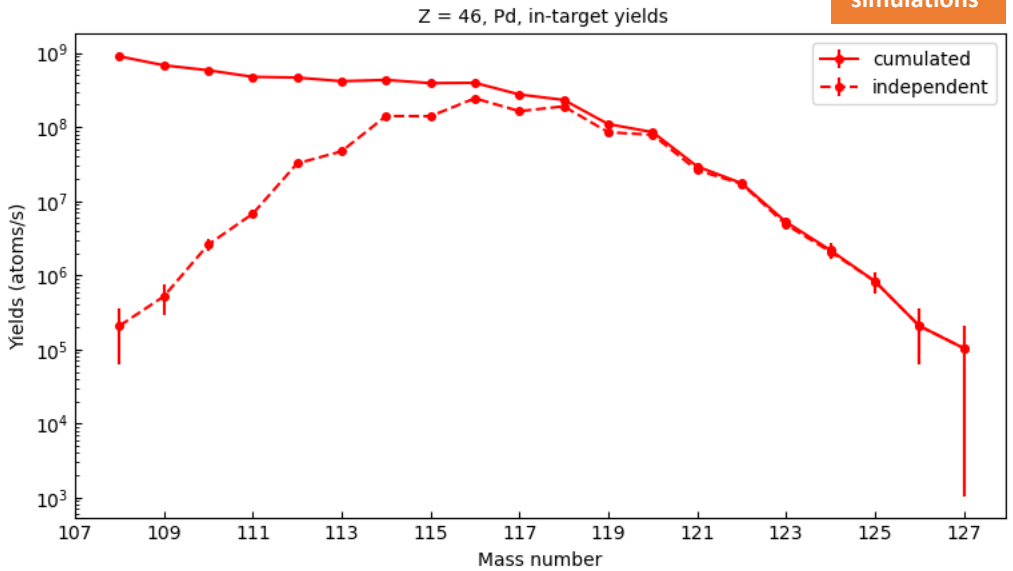

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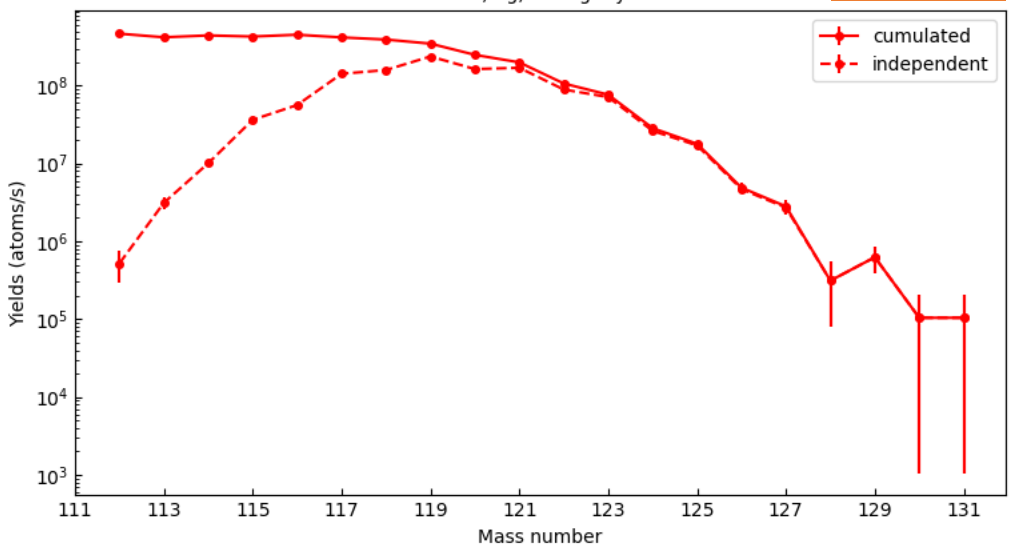

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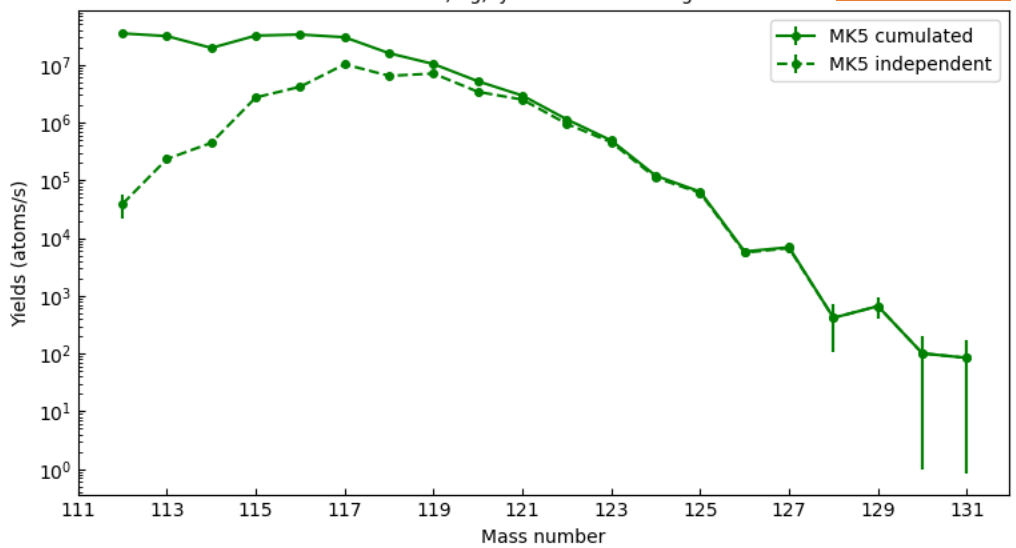

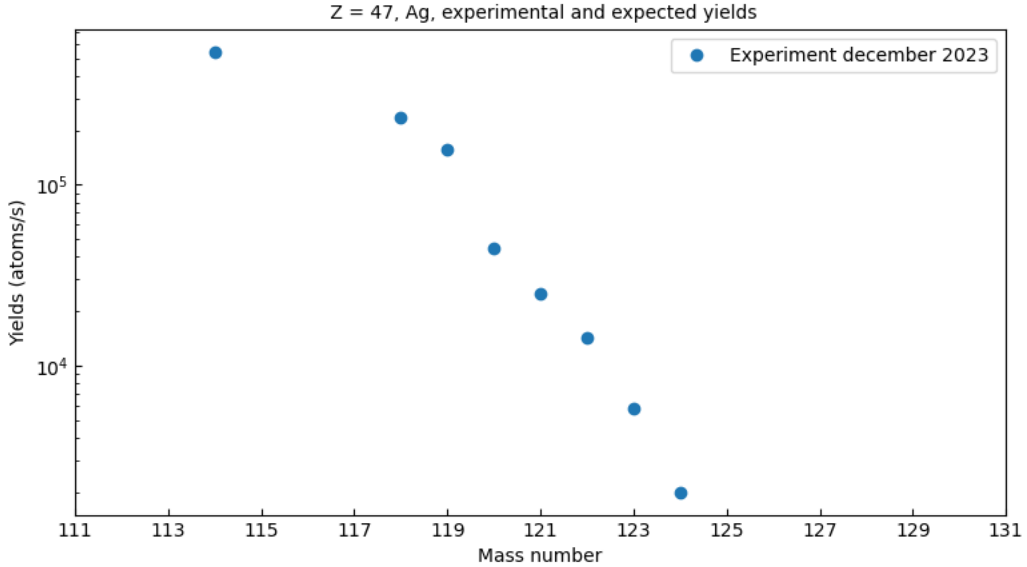

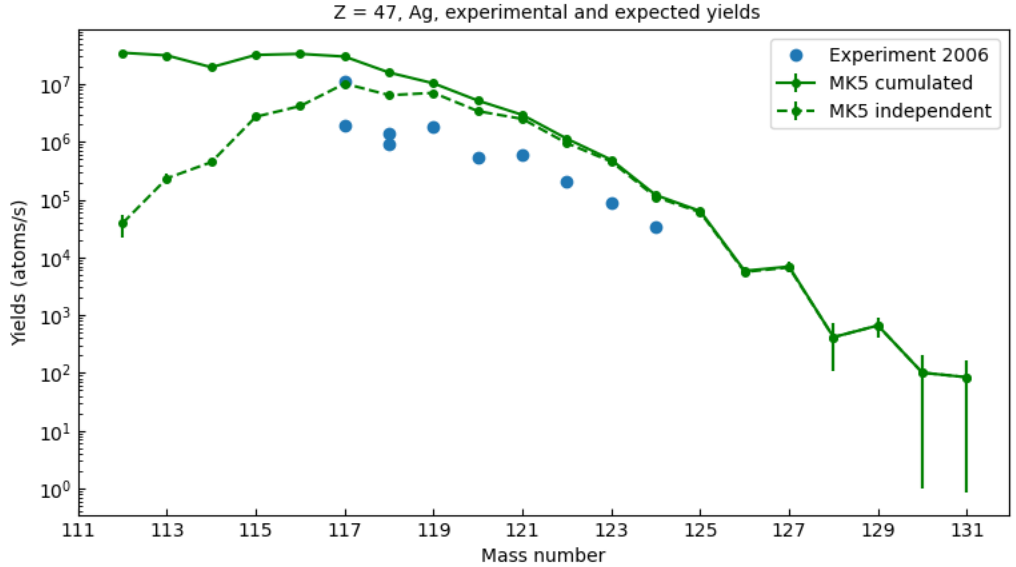

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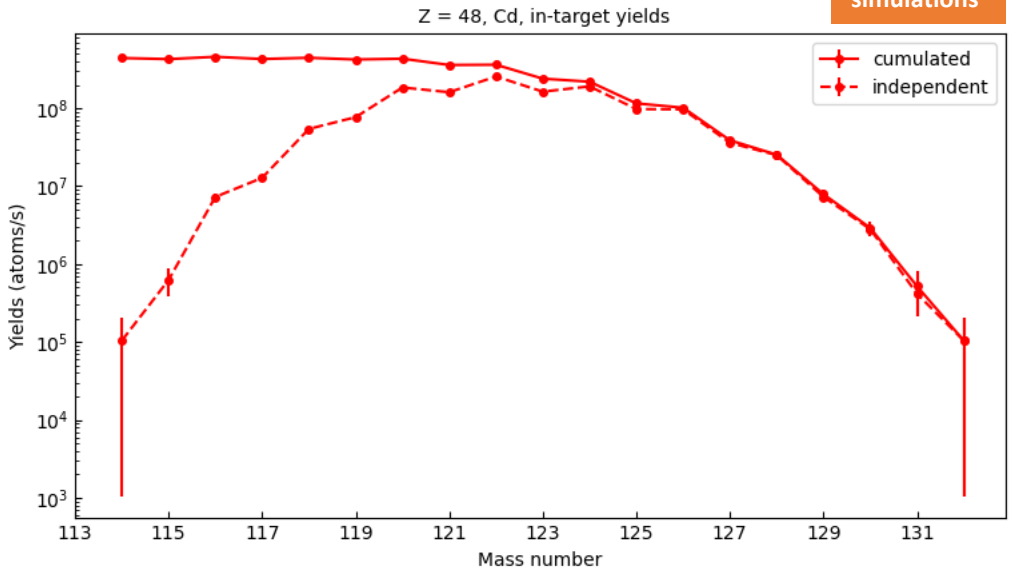
Accélérateur Linéaire et Tandem à Orsay

simulations



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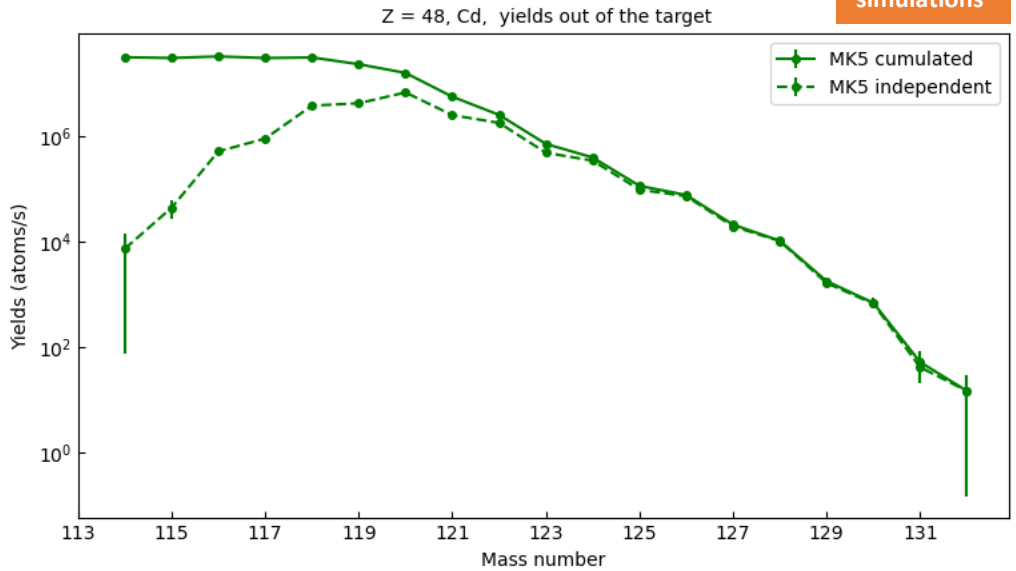

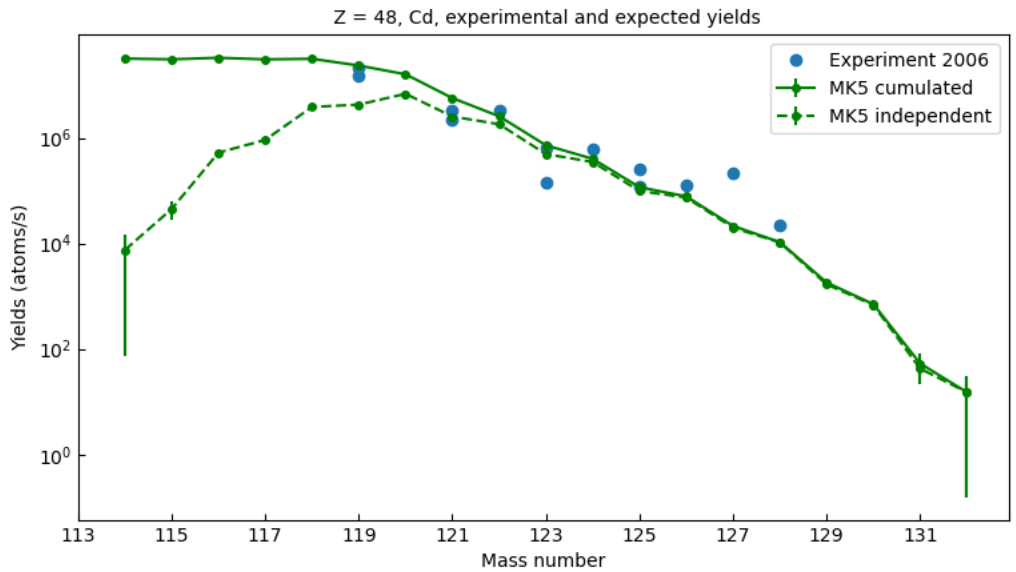

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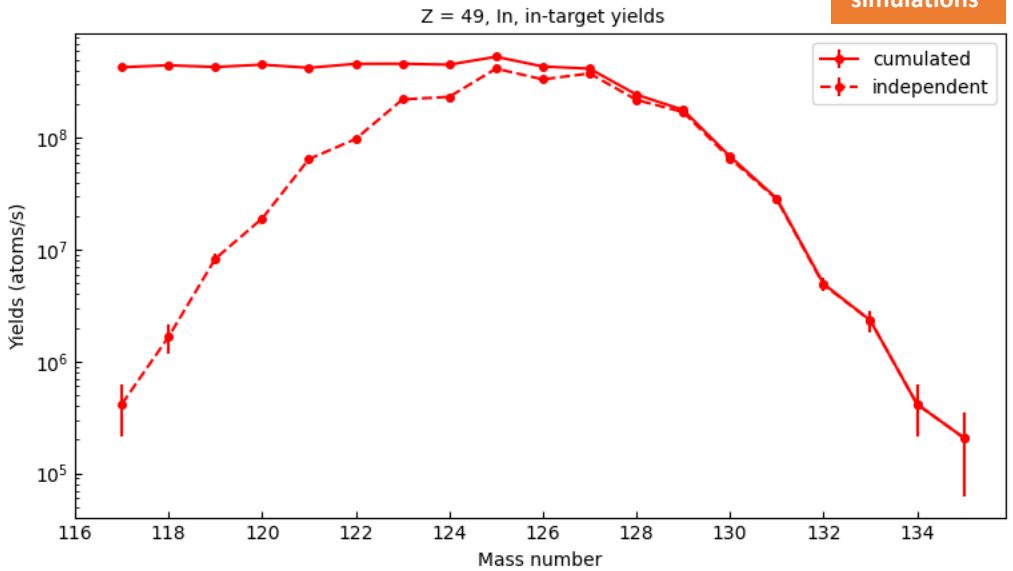

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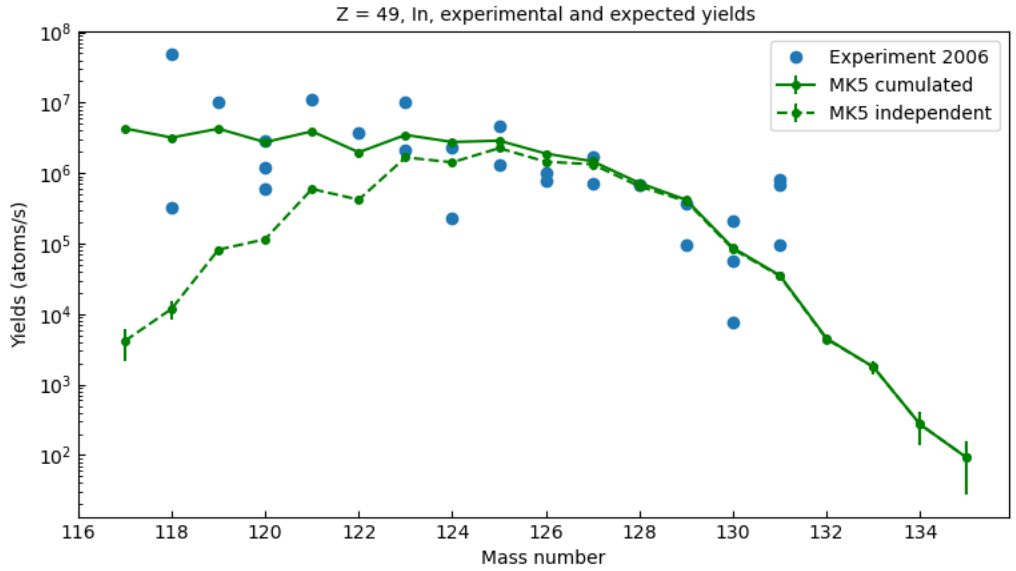

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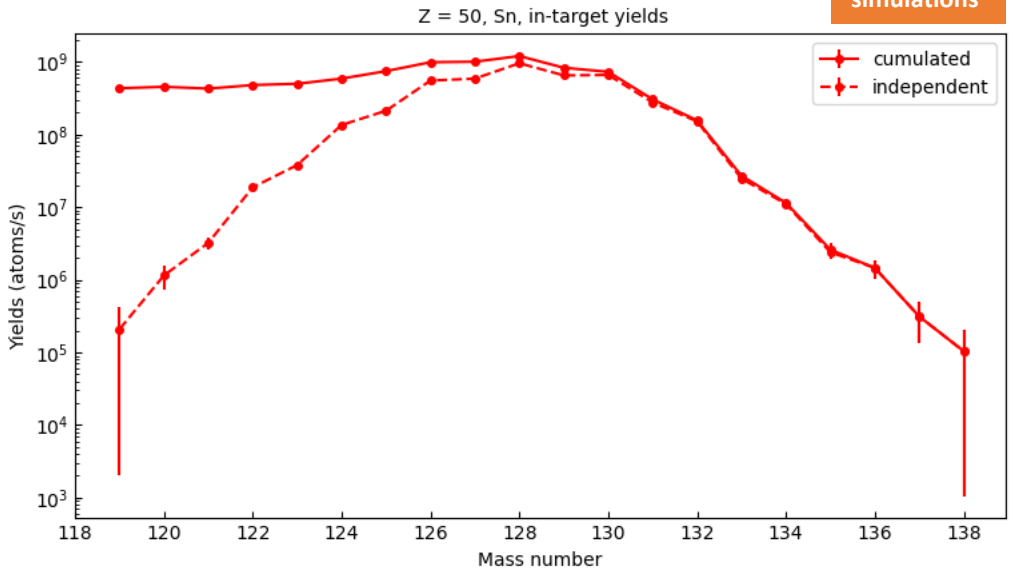
simulations



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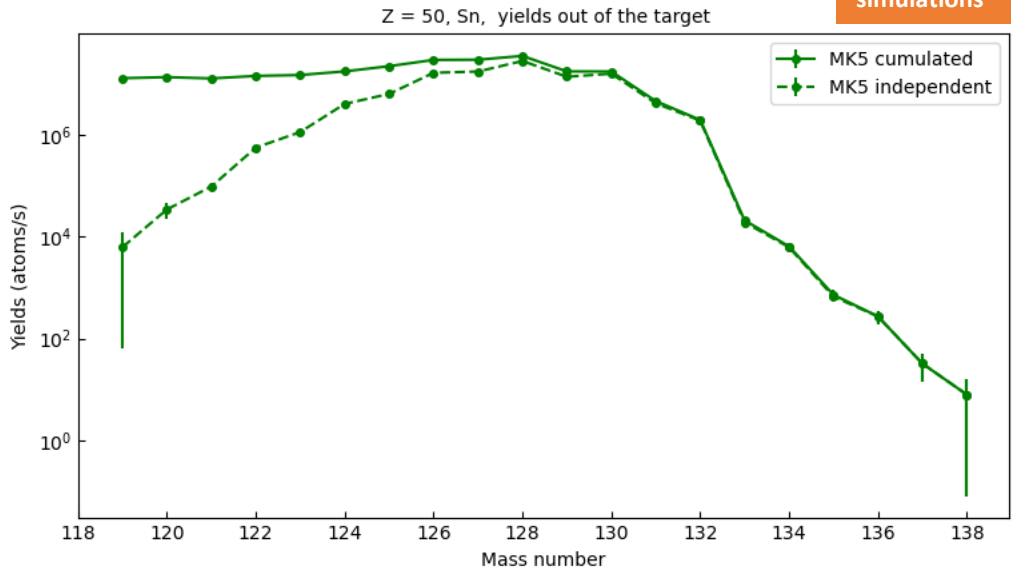

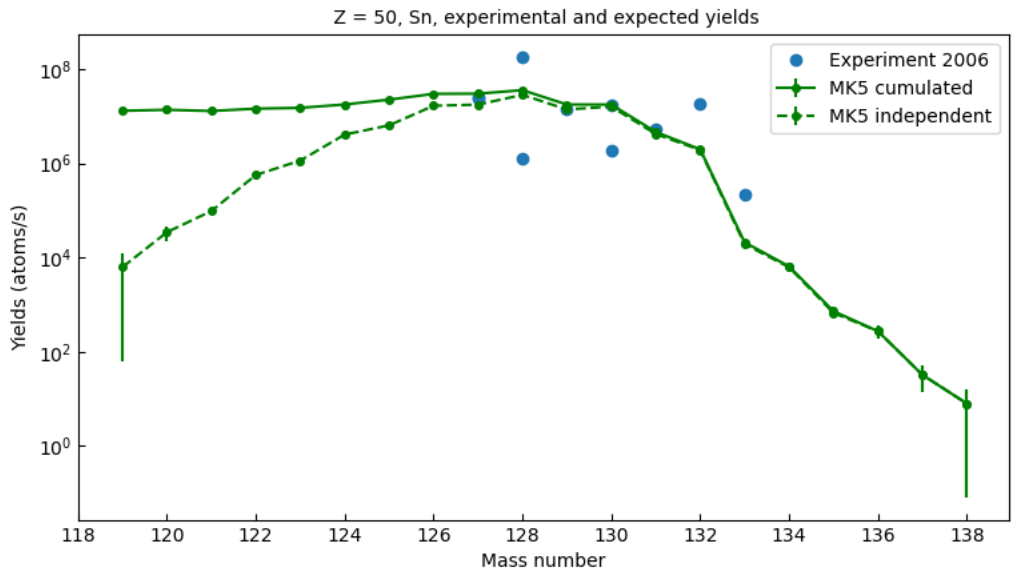

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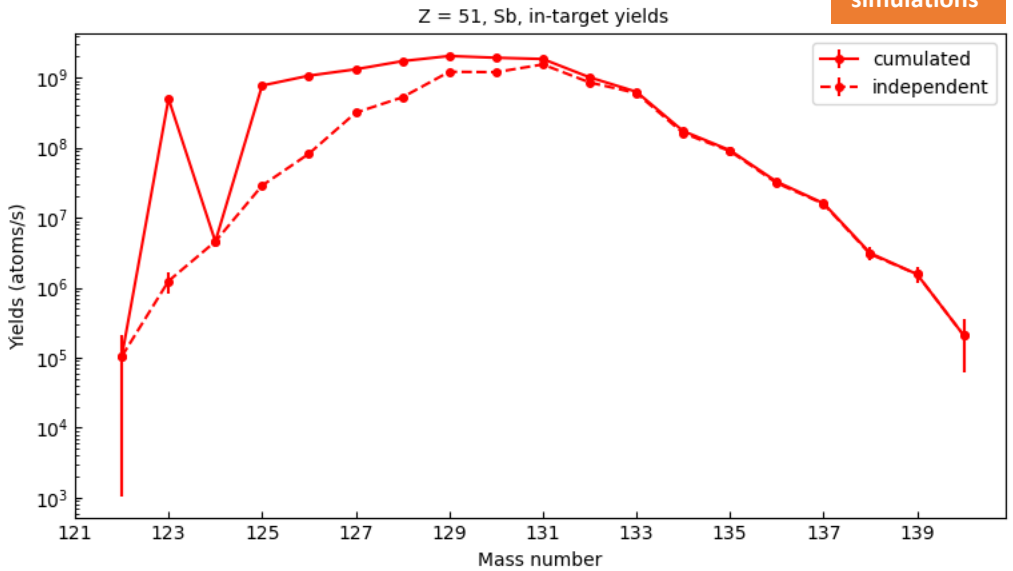

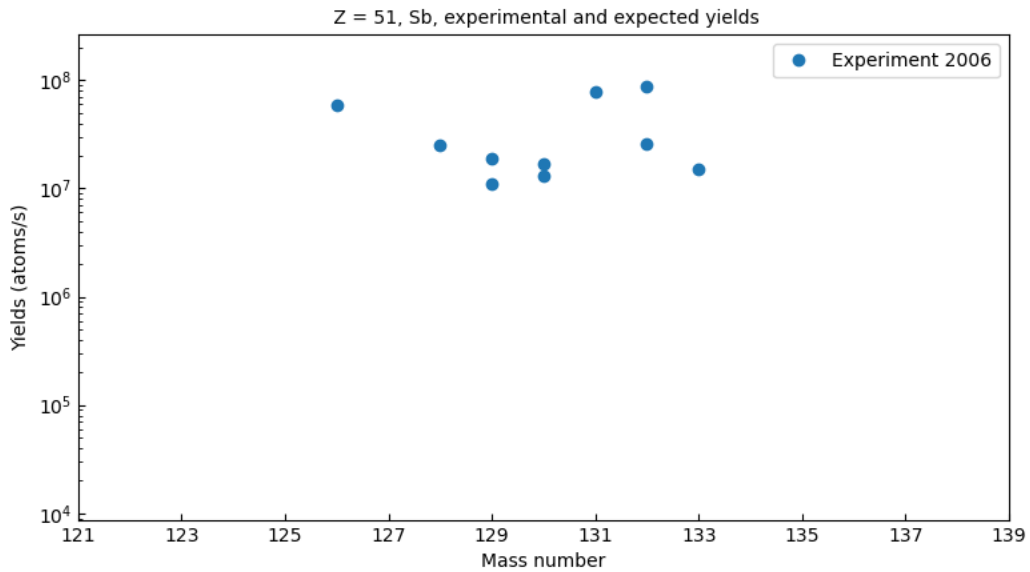

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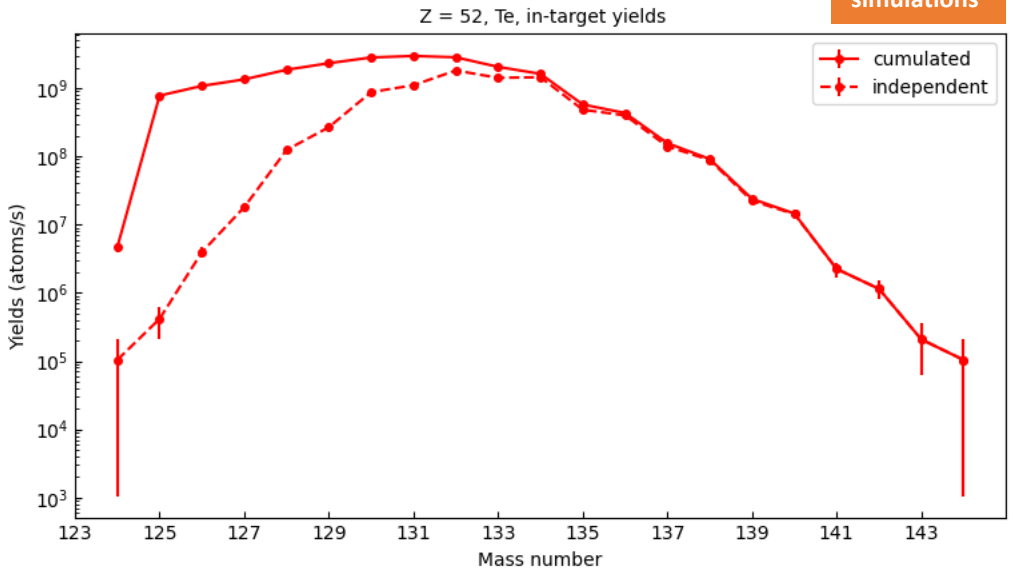

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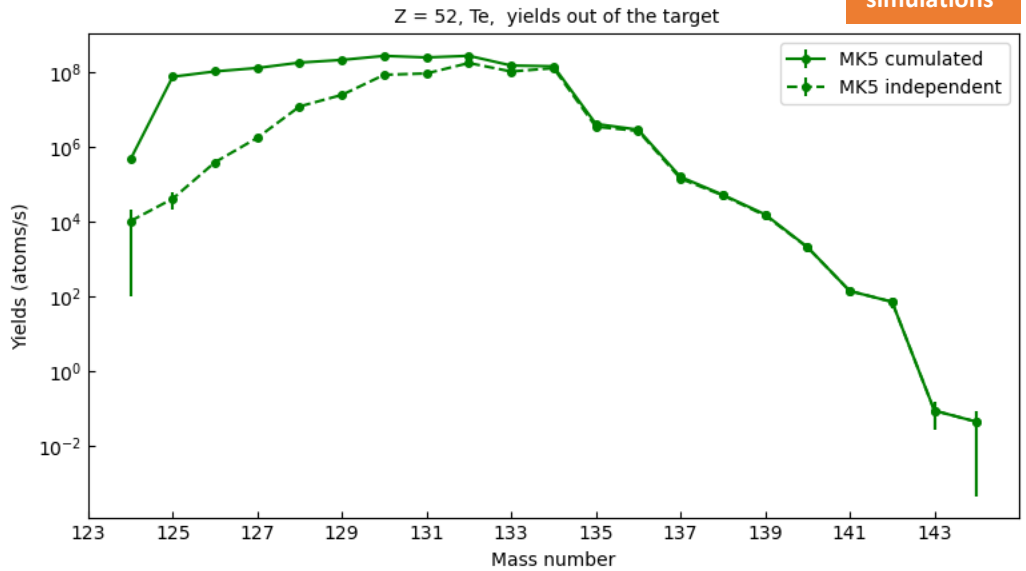

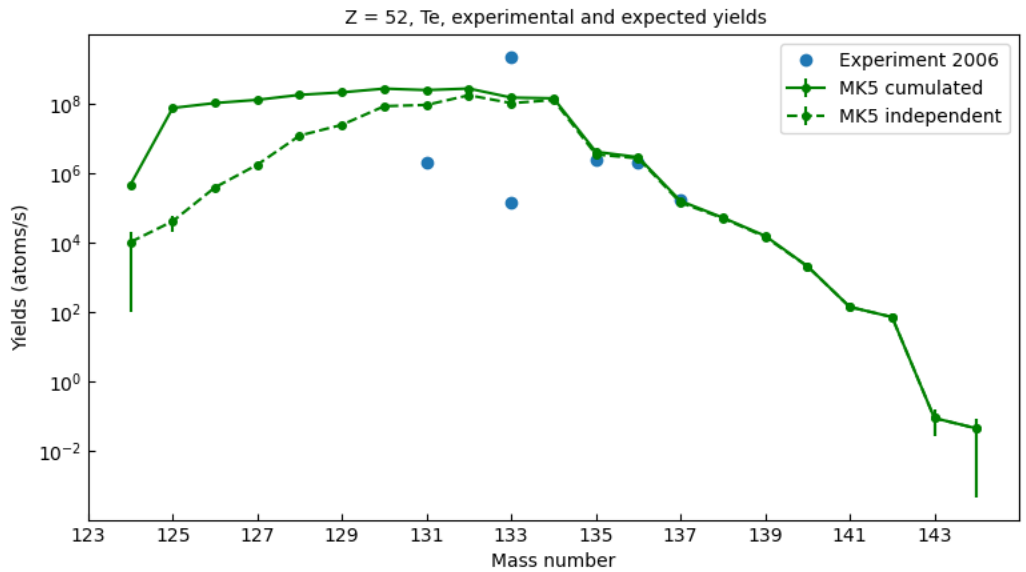

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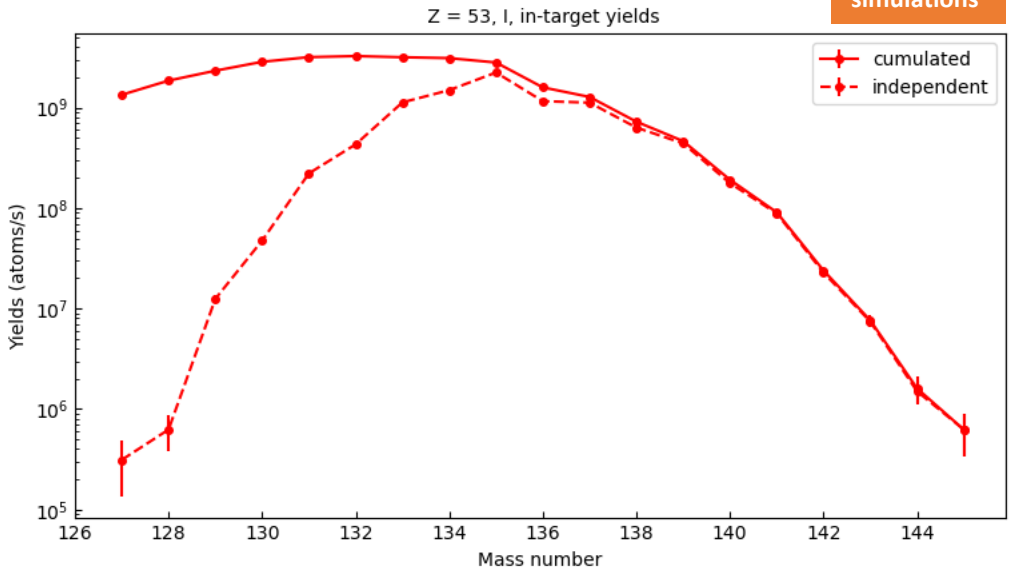

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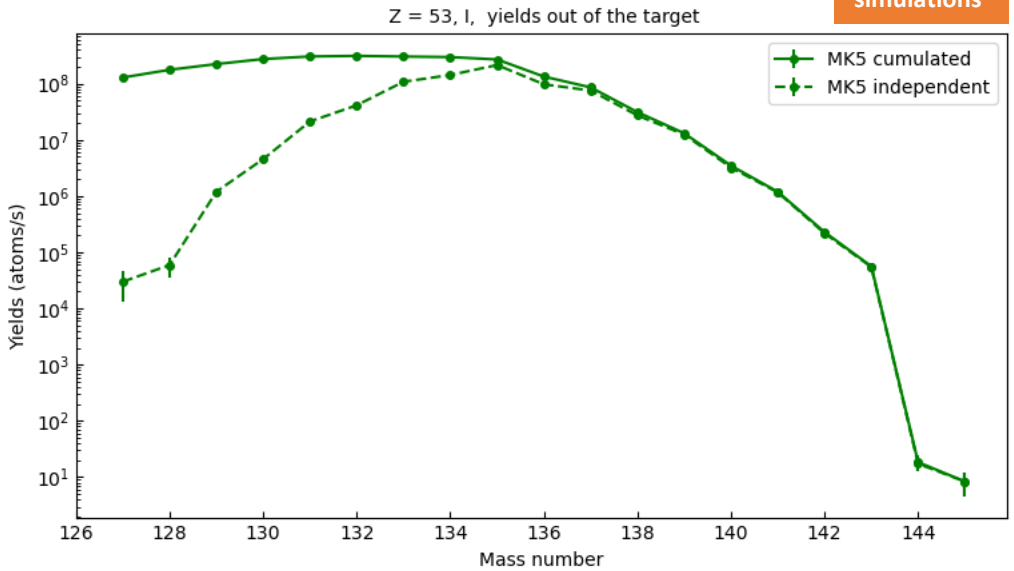

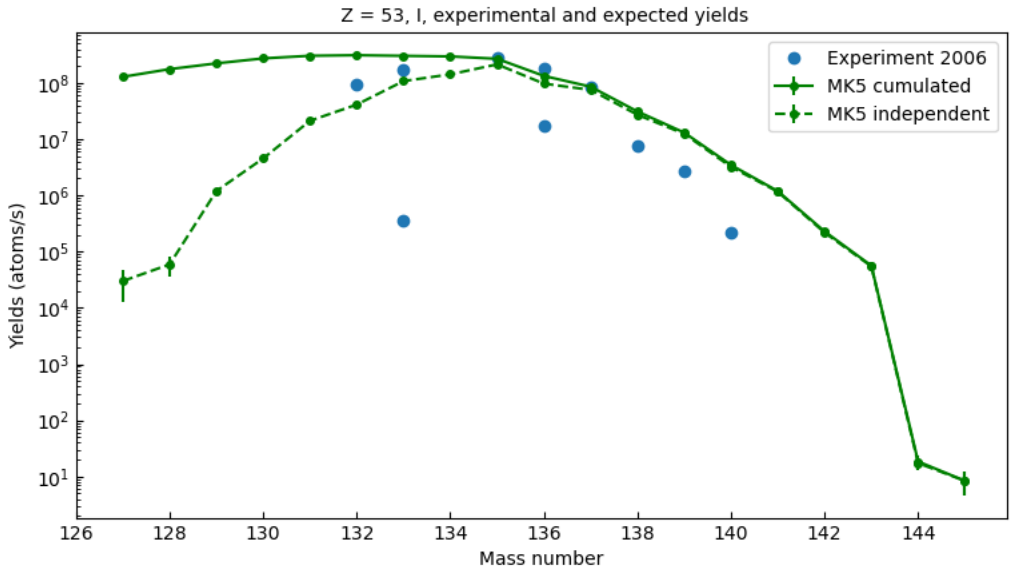

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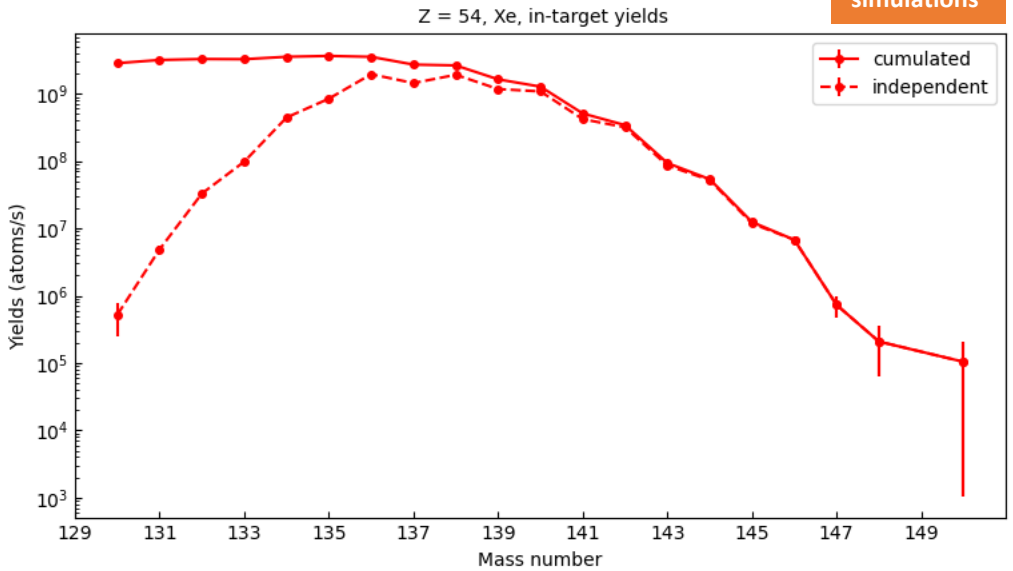

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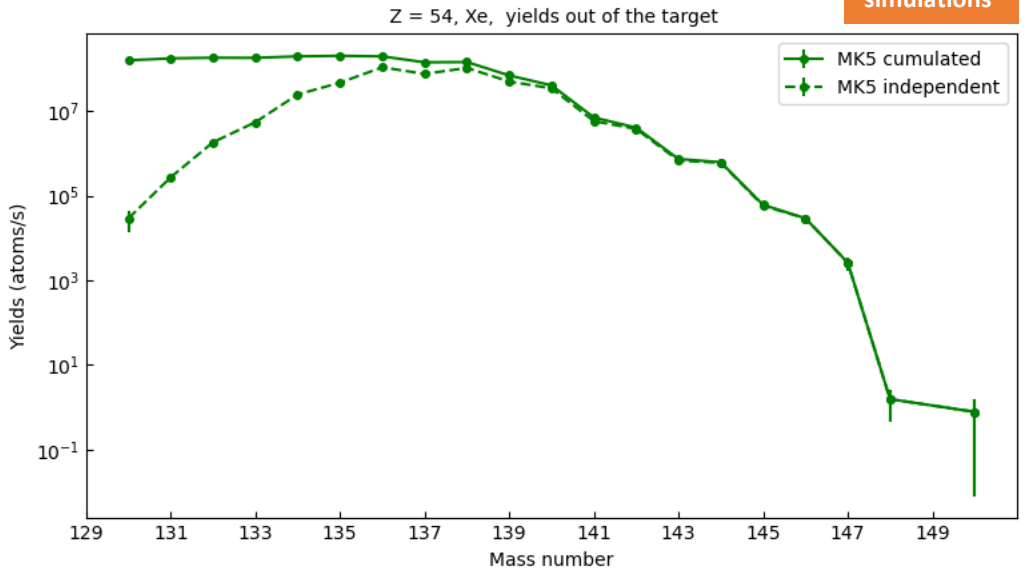

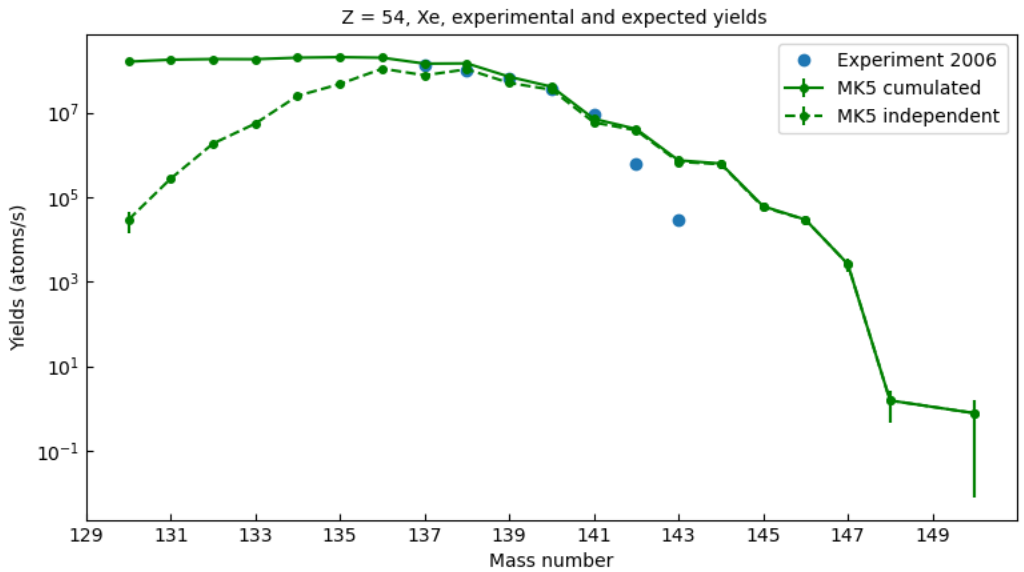

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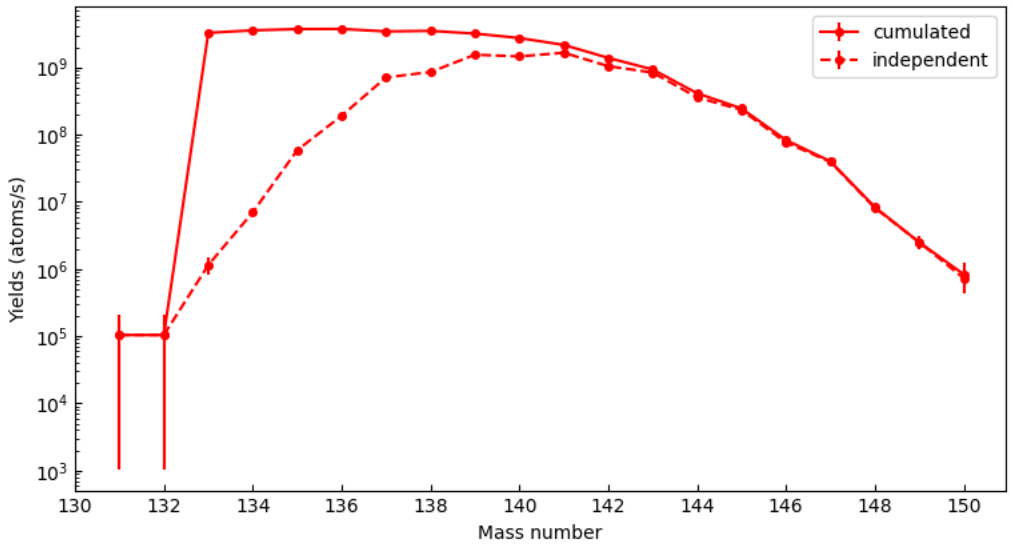

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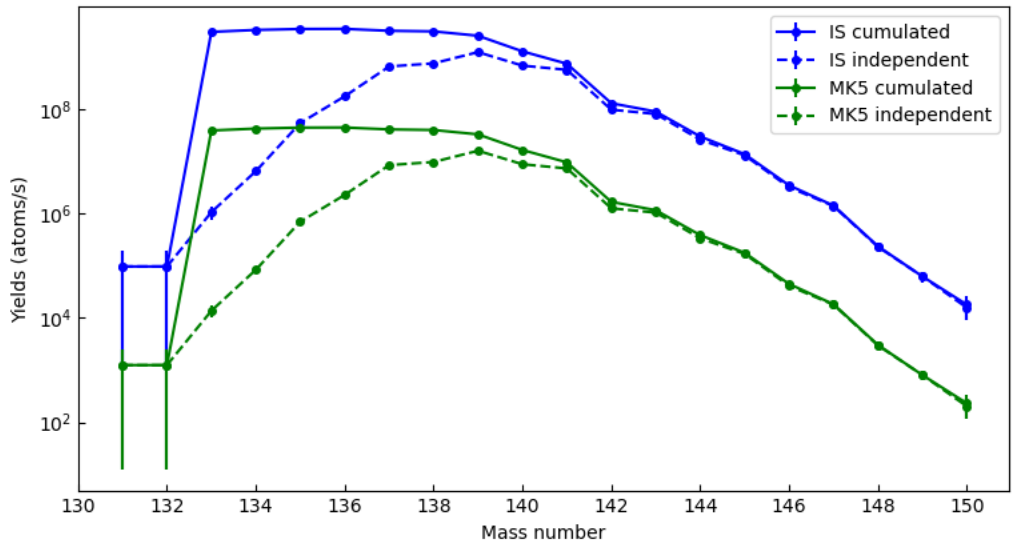

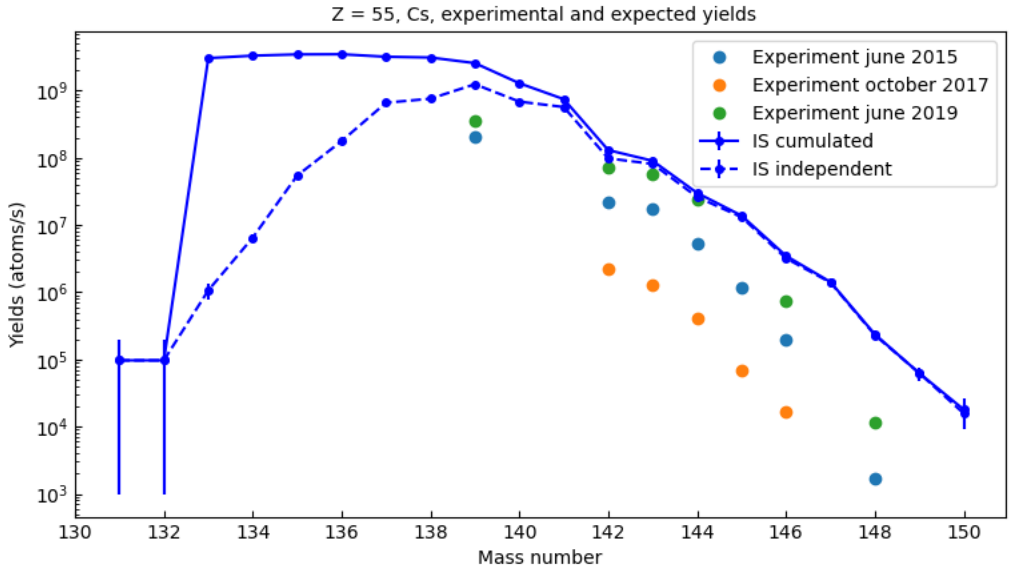

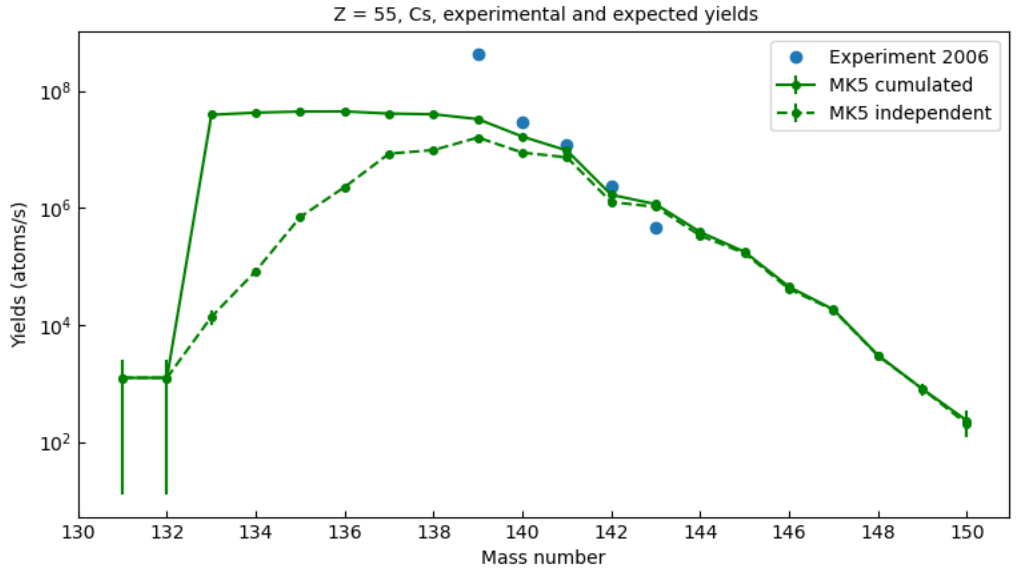

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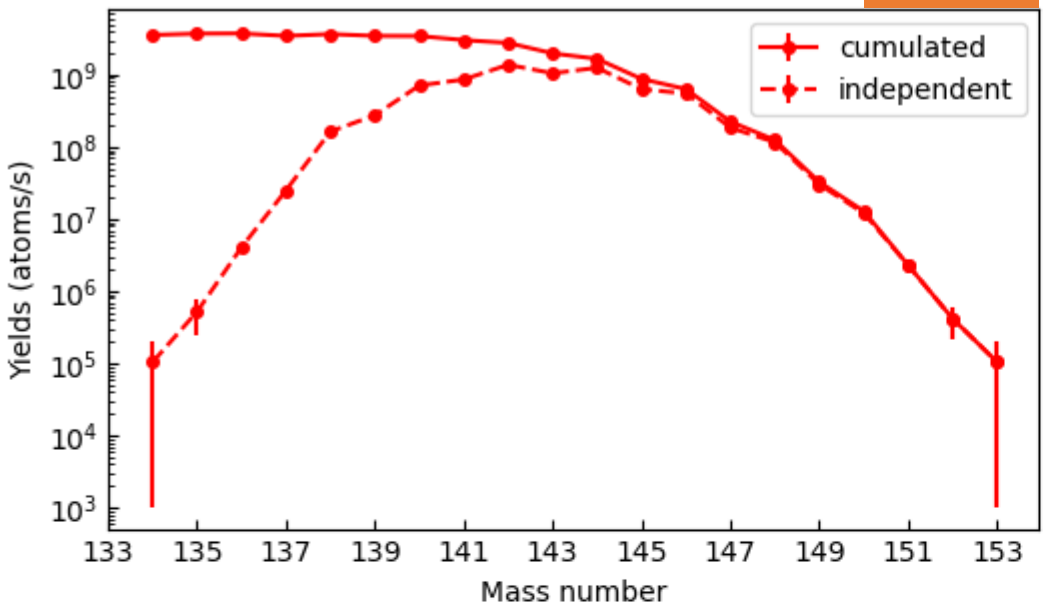
simulations



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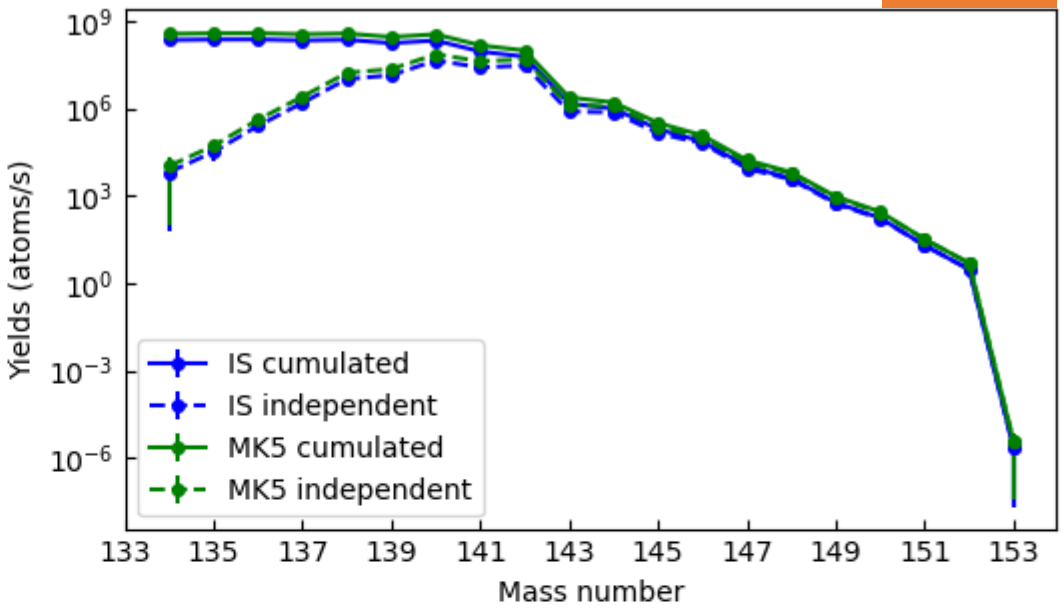

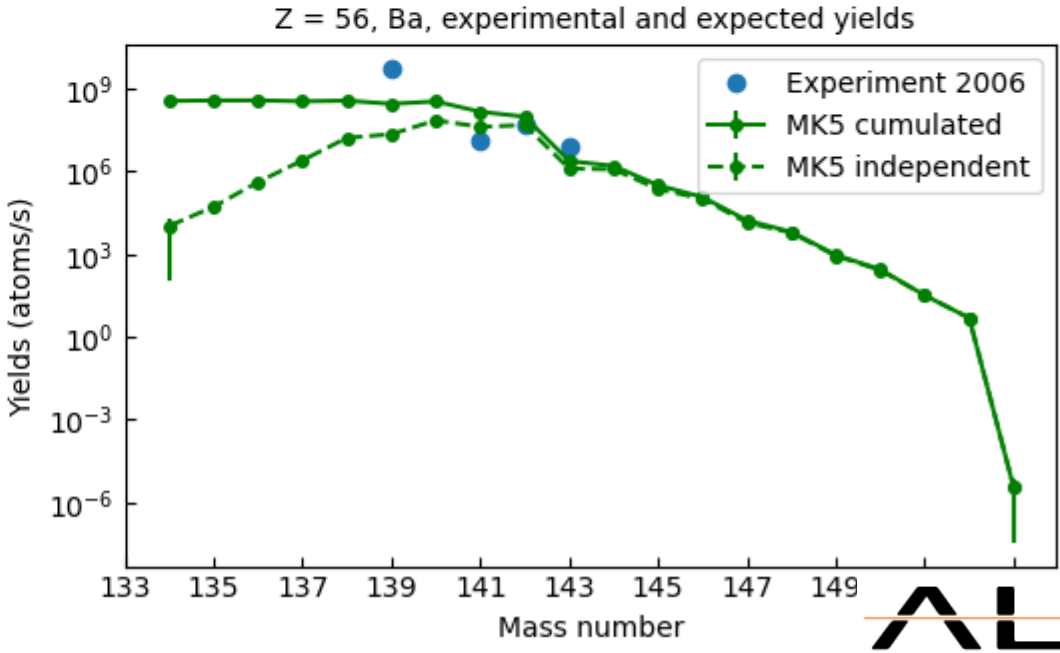

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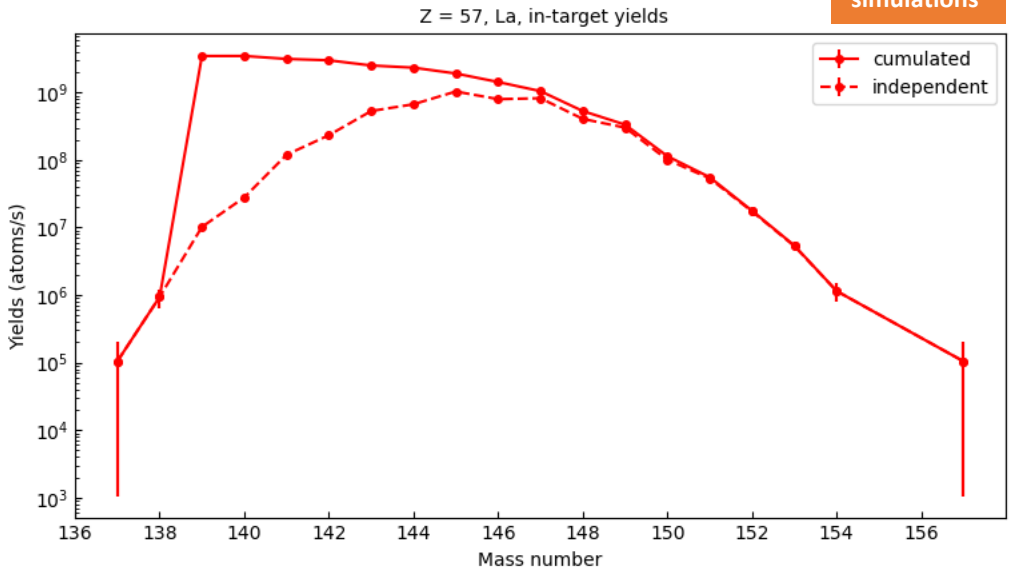

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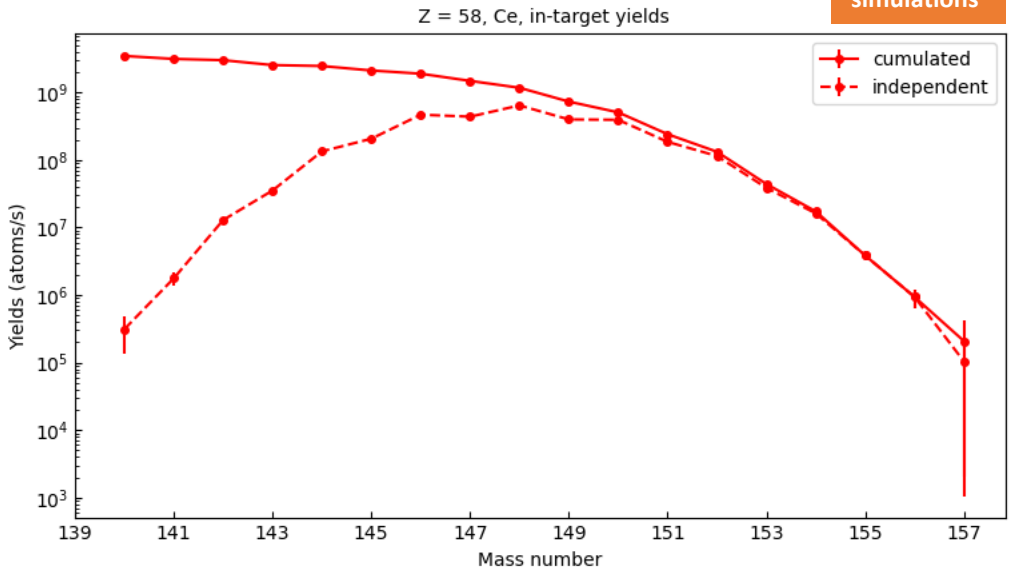

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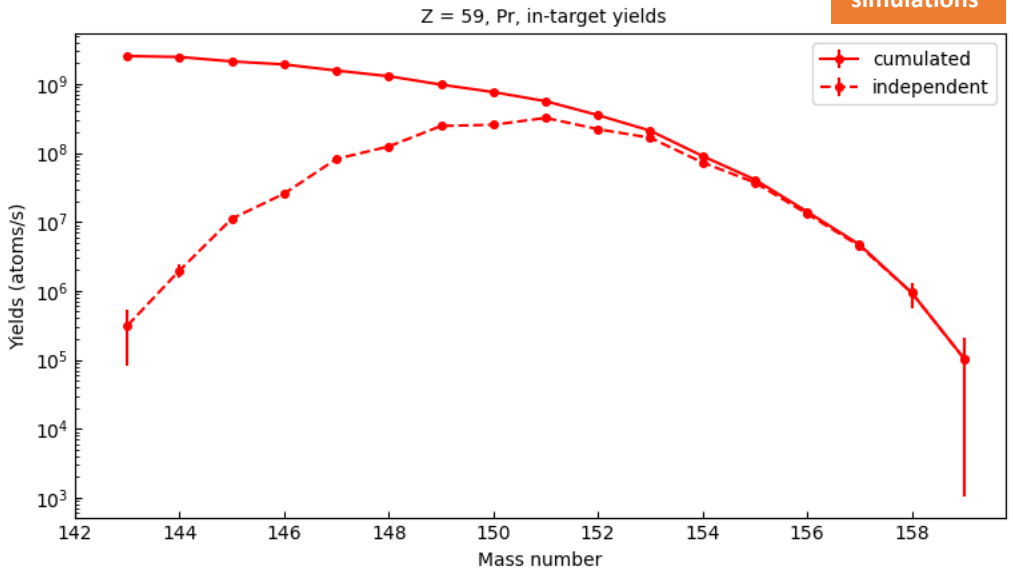

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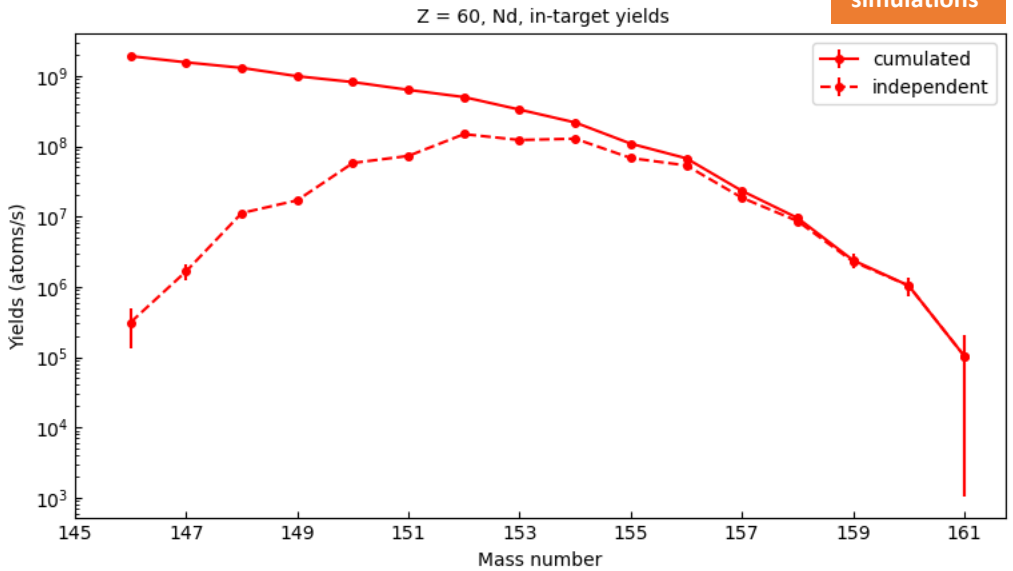

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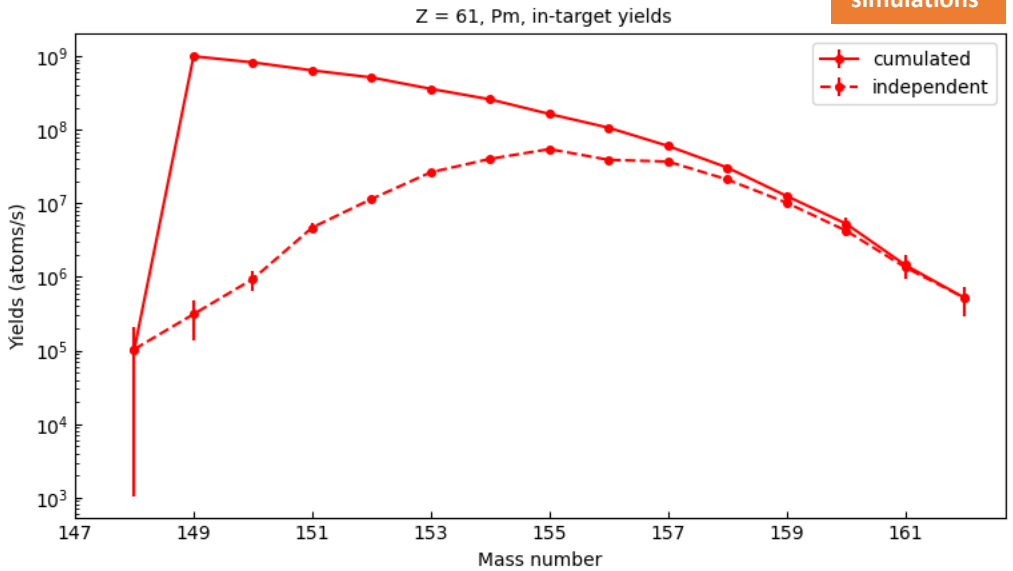

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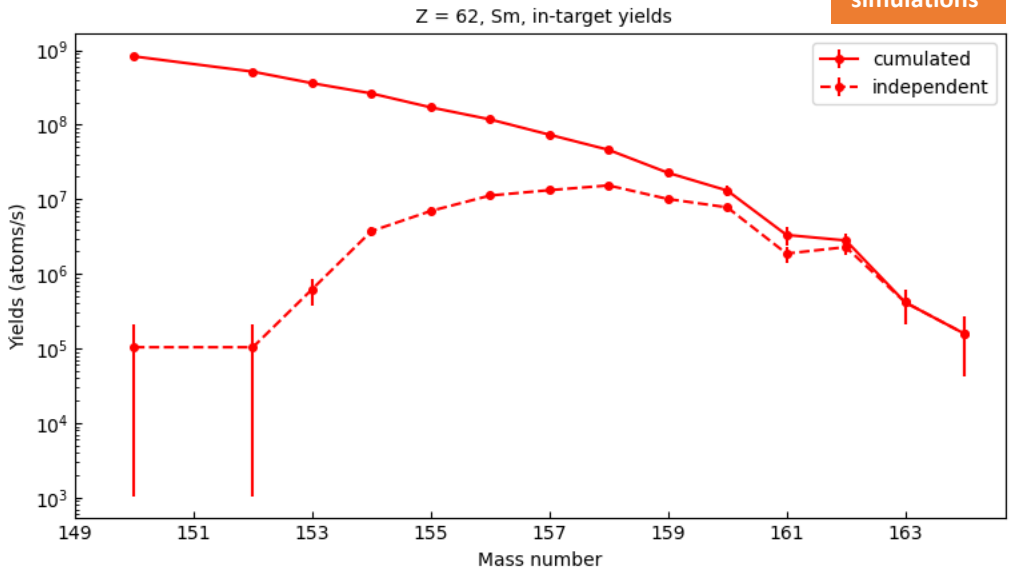

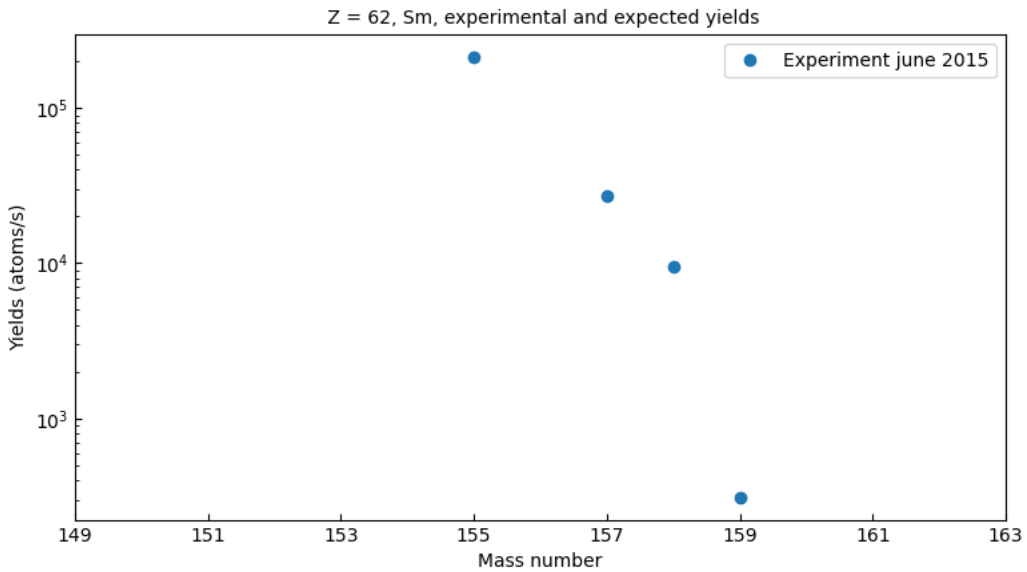

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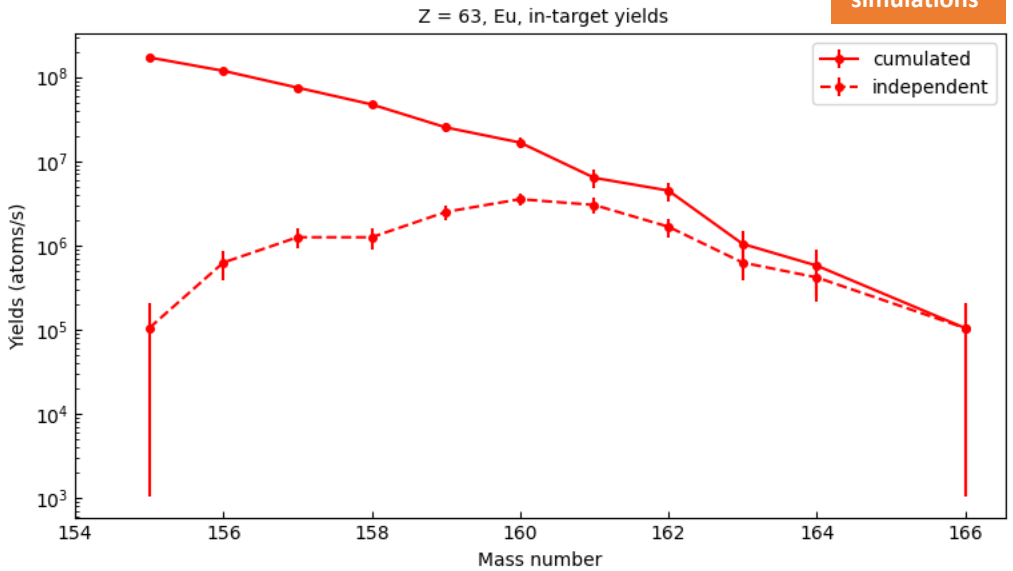

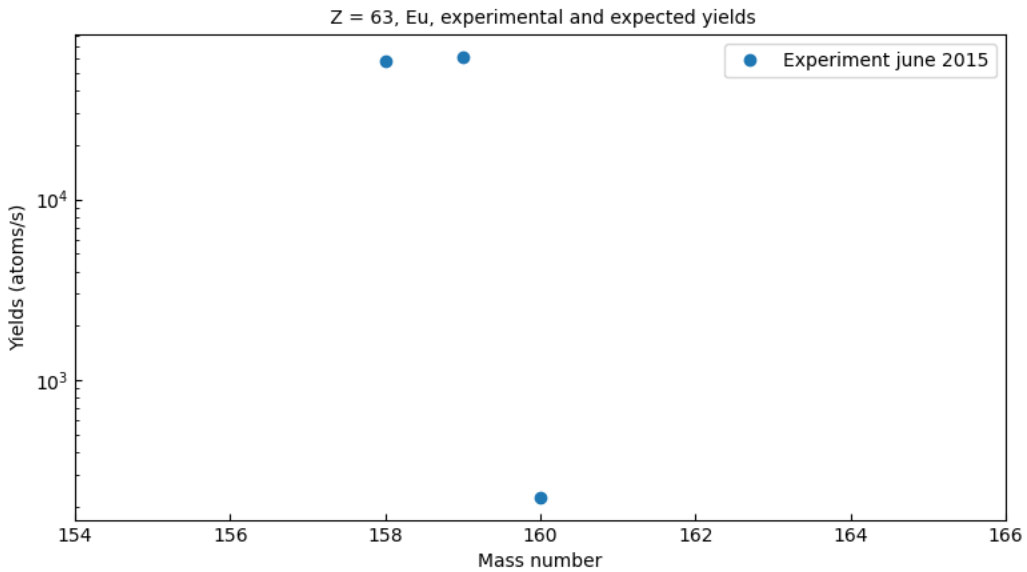

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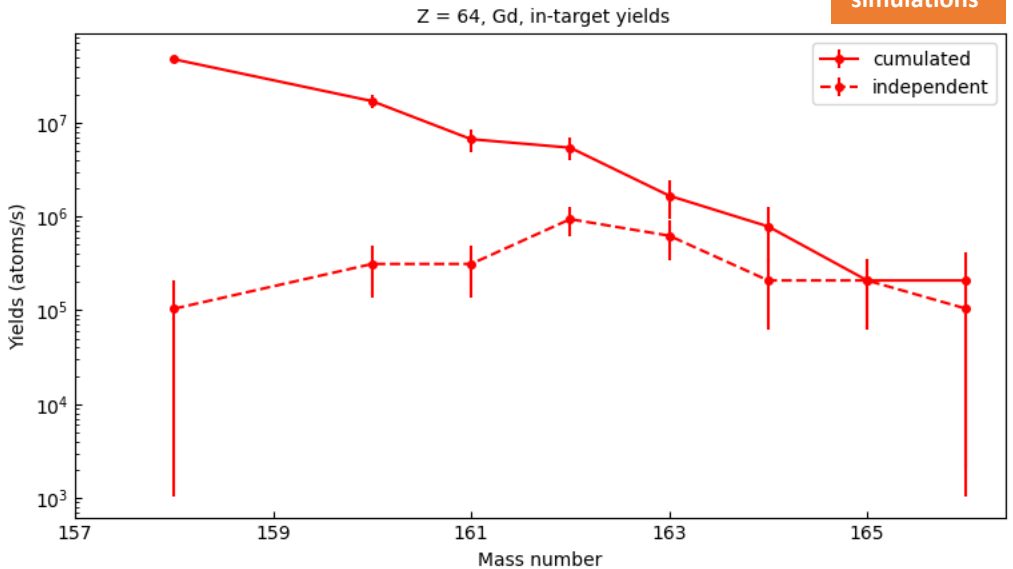

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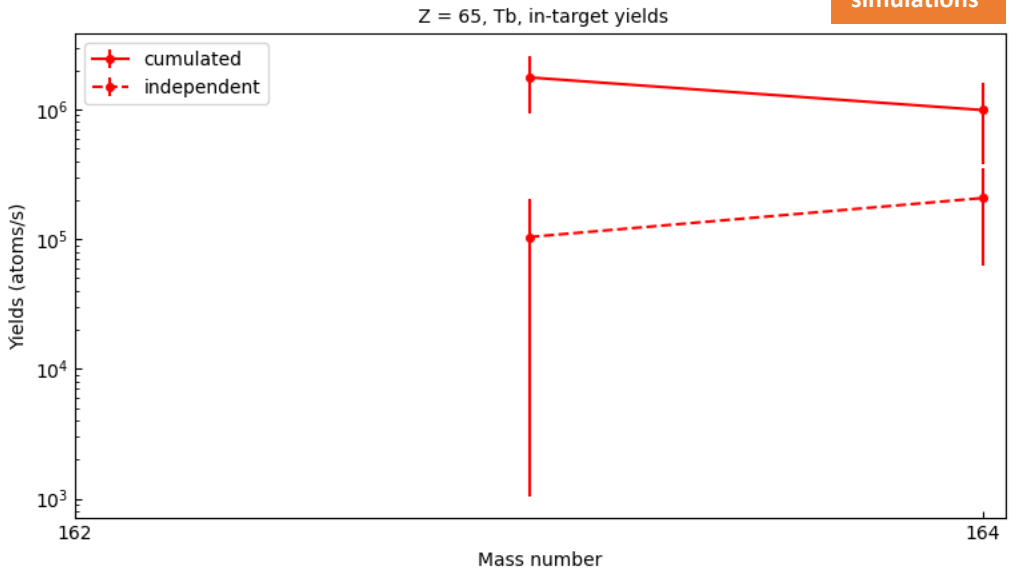

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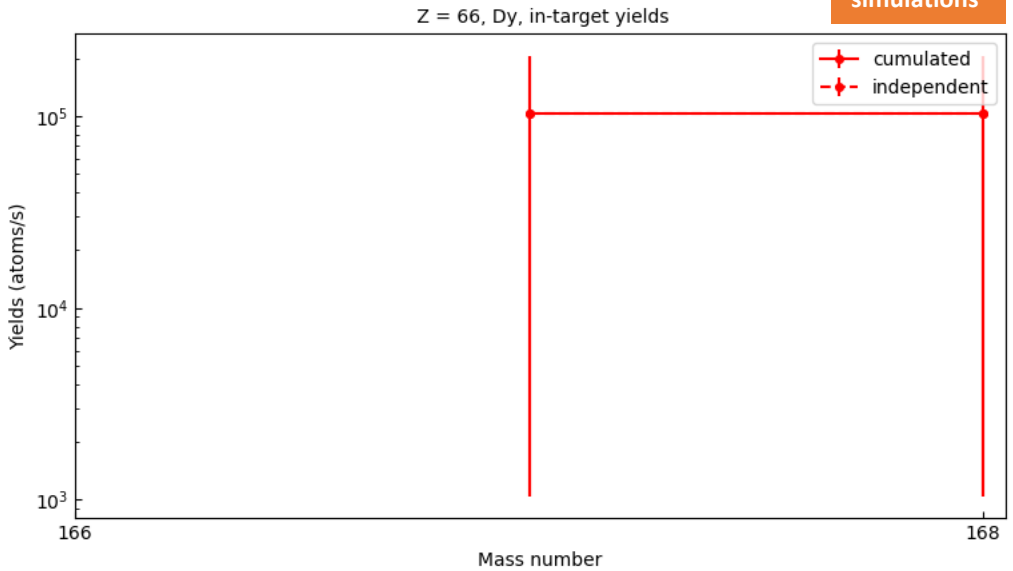

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