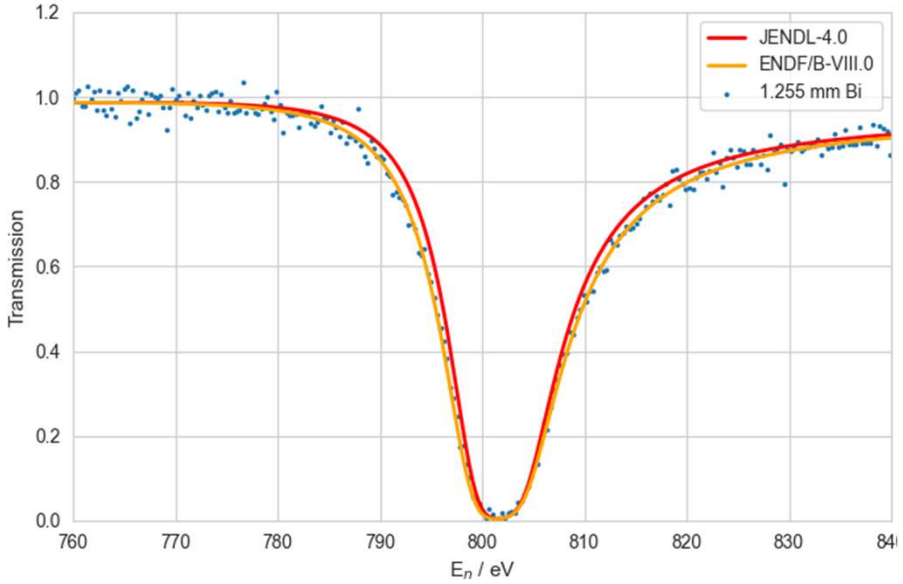
D2.5
Report on the measurements of the branching ratio for ^{209}Bi, ^{208}Pb(n,tot) and ^{238}U(n,inel) cross sections at GELINA

Measurements for ^{209}Bi (collaboration SCK-JRC)

- Branching ratio experiment at J-PARC (only calibrations and ROOT data)
- Additional measurements at GELINA
- Finished report on transmission data. Ready for EXFOR

Results of time-of-flight transmission measurements for 209Bi at a 50 m station of GELINA JRC136373

- Report includes an evaluation overview



- New project on ^{206}Bi capture at n_TOF leaded by IFIC Valencia

(invited to collaborate in J-PARC data)

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Transmission on Pb isotopes (collaboration SCK-JRC-CIEMAT)

- Transmission measurements on ^{206}Pb and ^{nat}Pb carried out in 2022 and 2023.
- ^{206}Pb analysis performed by CIEMAT PhD, almost complete.
- ^{nat}Pb measurements instead of ^{208}Pb due to lack of suitable sample.

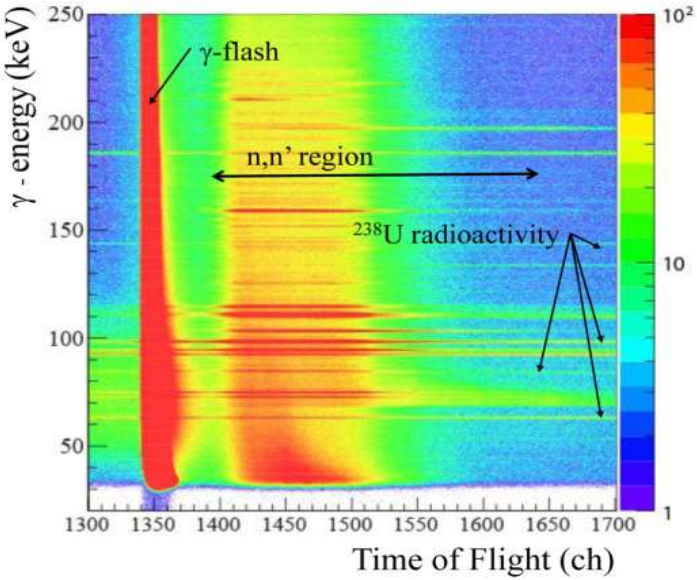
^{238}U(n,inel) cross sections at GELINA

- Work already published

- *Measurement of 238U(n, n'γ) cross section data and their impact on reaction models*
- M. Kerveno, M. Dupuis, et al. Physical Review C 104, 044605 (2021)
- https://dx.doi.org/10.1103/PhysRevC.104.044605

TABLE II. Selection of identified γ energies [38] in the ^{238}U energy spectra stemming from the ^{238}U(n, n') reactions. The possible contamination of the peak in the spectra is mentioned in the three last columns. Levels are labeled as J_k^Π where J is the level total angular momentum, $\Pi = +/-$ its parity, and k counts the levels of the same J^Π by increasing excitation energy.

	Initial state		Final state				Peak pollution		
E_γ (keV)	E (keV)	J_k^Π	E (keV)	J_k^Π	I_γ	γ multipolarity	Process	E_γ (keV)	E_{level} (keV)
44.915 (13)	44.916 (13)	2_1^+	0	0_1^+	100	$E2$			
103.50 (4)	148.38 (3)	4_1^+	44.916 (13)	2_1^+	100	$E2$	X $K\beta 3$	104.6	
							^{238}U$(n, 2n)^{237}$U	103.68	159.962
159.018 (16)	307.18 (8)	6_1^+	148.38 (3)	4_1^+	100	$E2$	^{63}Cu$(n, \gamma)^{64}$Cu	159.28	159.28
210.6 (4)	518.1 (3)	8_1^+	307.18 (8)	6_1^+	100	$E2$			
218.1 (3)	950.12 (20)	2_1^-	731.93 (3)	3_1^-	53 (6)	?			
251.2 (7)	930.55 (9)	1_2^-	680.11 (4)	1_1^-	13.1 (14)	?	^{238}U$(n, \gamma)^{239}$U	250.06	292.6
257.8 (4)	775.9 (4)	10_1^+	518.1 (3)	8_1^+	100	$E2$			
270.1 (4)	950.12 (20)	2_1^-	680.11 (4)	1_1^-	48 (8)	?			
519.46 (8)	826.64 (11)	5_1^-	307.18 (8)	6_1^+	50 (3)	$E1$			
583.55 (3)	731.93 (3)	3_1^-	148.38 (3)	4_1^+	81.4 (16)	$E1$	^{208}Pb$(n, n')^{208}$Pb	583.19	3500
							^{63}Cu$(n, n')^{63}$Cu	584.82	1547
635.3 (3)	680.11 (4)	1_1^-	44.916 (13)	2_1^+	100.0 (20)	$E1$			
678.3 (3)	826.64 (11)	5_1^-	148.38 (3)	4_1^+	100 (6)	$E1$			
680.2 (5)	680.11 (4)	1_1^-	0	0_1^+	79 (4)	$E1$			
686.99 (3)	731.93 (3)	3_1^-	44.916 (13)	2_1^+	100 (2)	$E1$			
849.1 (4)	997.58 (7)	3_2^-	148.38 (3)	4_1^+	100 (3)	$E1$	^{238}U$(n, 2n)^{237}$U	849.45 (13)	905.73 (7)
885.46 (10)	930.55 (9)	1_2^-	44.916 (13)	2_1^+	100 (4)	$E1$			
905.5 (5)	950.12 (20)	2_1^-	44.916 (13)	2_1^+	100 (6)	$E1$			
952.65 (7)	997.58 (7)	3_2^-	44.916 (13)	2_1^+	56.8 (13)	$E1$			



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Conclusions

- Deliverable for D2.5 in preparation and will be in time (March 2024)

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Thank you

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