UNIVERSIDAD POLITÉCNICA DE MADRID

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INDUSTRIALES ETSII | UPM

MAPPING OF ND EVALUATIONS

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CONTENT

- ❑ Objectives
- ❑ Programs
- ❑ Results

Objectives

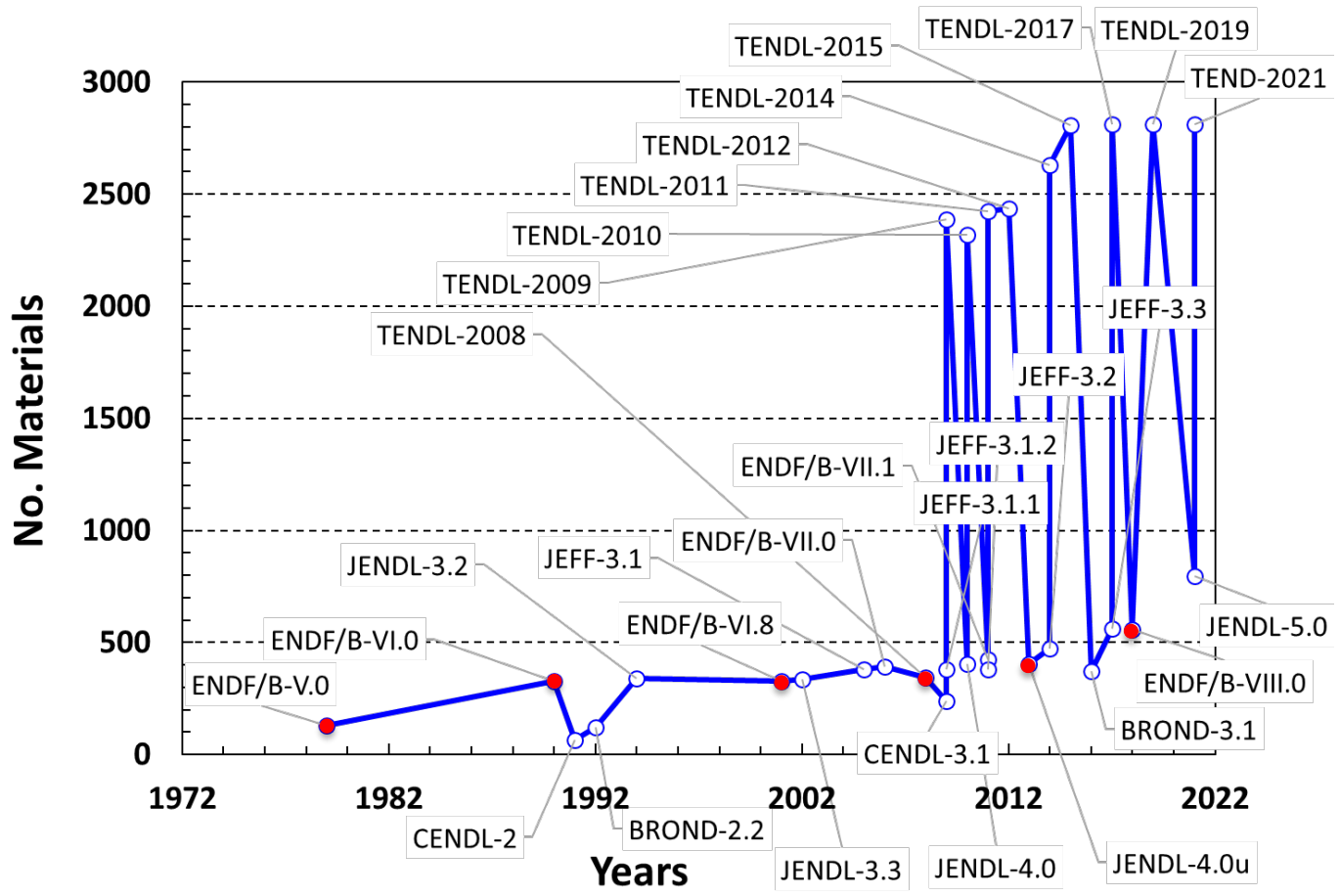
- **First task:** Trace the origin of the nuclear data of the brand-new library JEFF-4.0T2.2 (February 2023)

  - Different versions of previous ND evaluations (29) to be compared:
    - JEFF: *JEF2.2, JEFF-3.0, JEFF-3.1, JEFF-3.1.1, JEFF-3.1.2, JEFF-3.2, JEFF-3.3*
    - JENDL: *JENDL-3.2 , JENDL-3.3, JENDL-4.0, JENDL-4.0u, JENDL-5.0, JENDL-5.0upd*
    - ENDF: *ENDF/B-VI.8, ENDF/B-VII.0, ENDF/B-VII.1, ENDF/B-VIII.0, ENDF/B-VIII.0T1*
    - CENDL: *CENDL-2, CENDL-2.2, CENDL-3.1, CENDL-3.2*
    - *ROSFOND-2010* and BROND: *BROND-2.2, BROND-3.1*
    - TENDL: *2012, 2014, 2017, 2019, 2021*

- **Second task:** Look for the missing data that appeared in older versions of the JEFF library but not in 4T2 version.

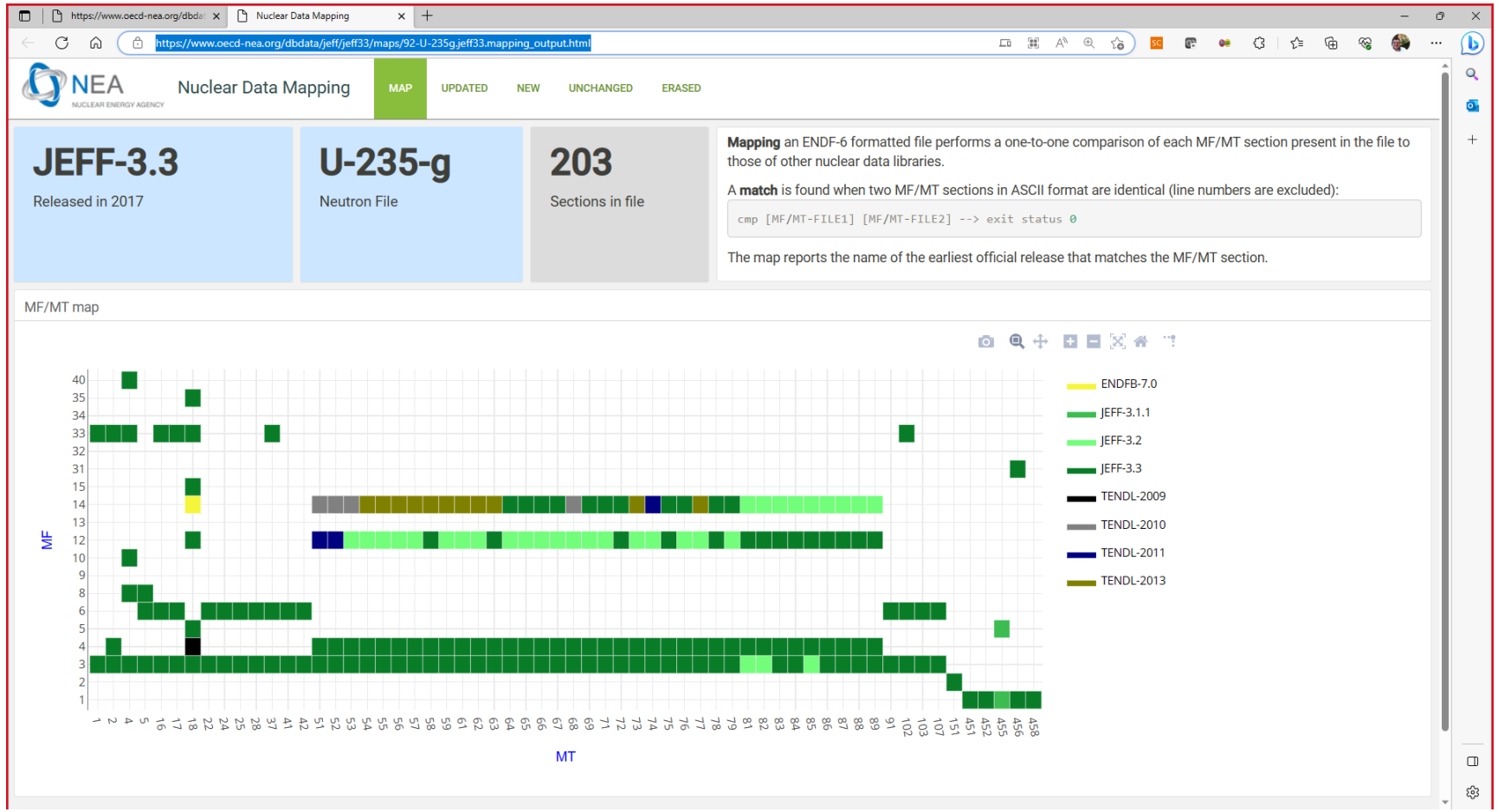
Background

❑ International efforts on evaluation of ND



Background – Mapping NEA/JEFF-3.3

❑ "NEA/JEFF-3.3 Mapping"

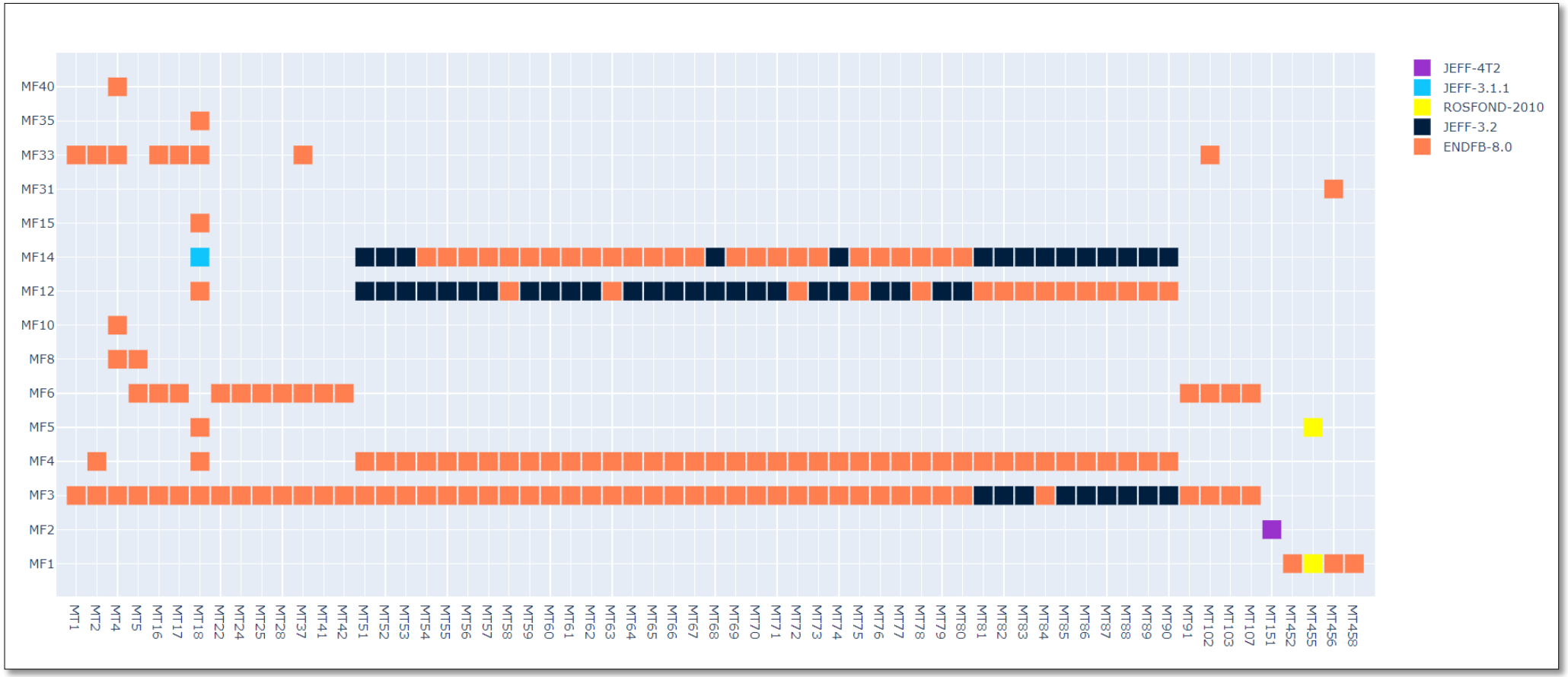


Ref.: *C.J. Diez, "Origin of files in JEFF-3.3-T1", JEF/DOC-1734, April 2016*

https://www.oecd-nea.org/dbdata/jeff/jeff33/maps/92-U-235g.jeff33.mapping_output.html

❑ "UPM-INGENIA Mapping" … JEFF-4.0T2.2!!!

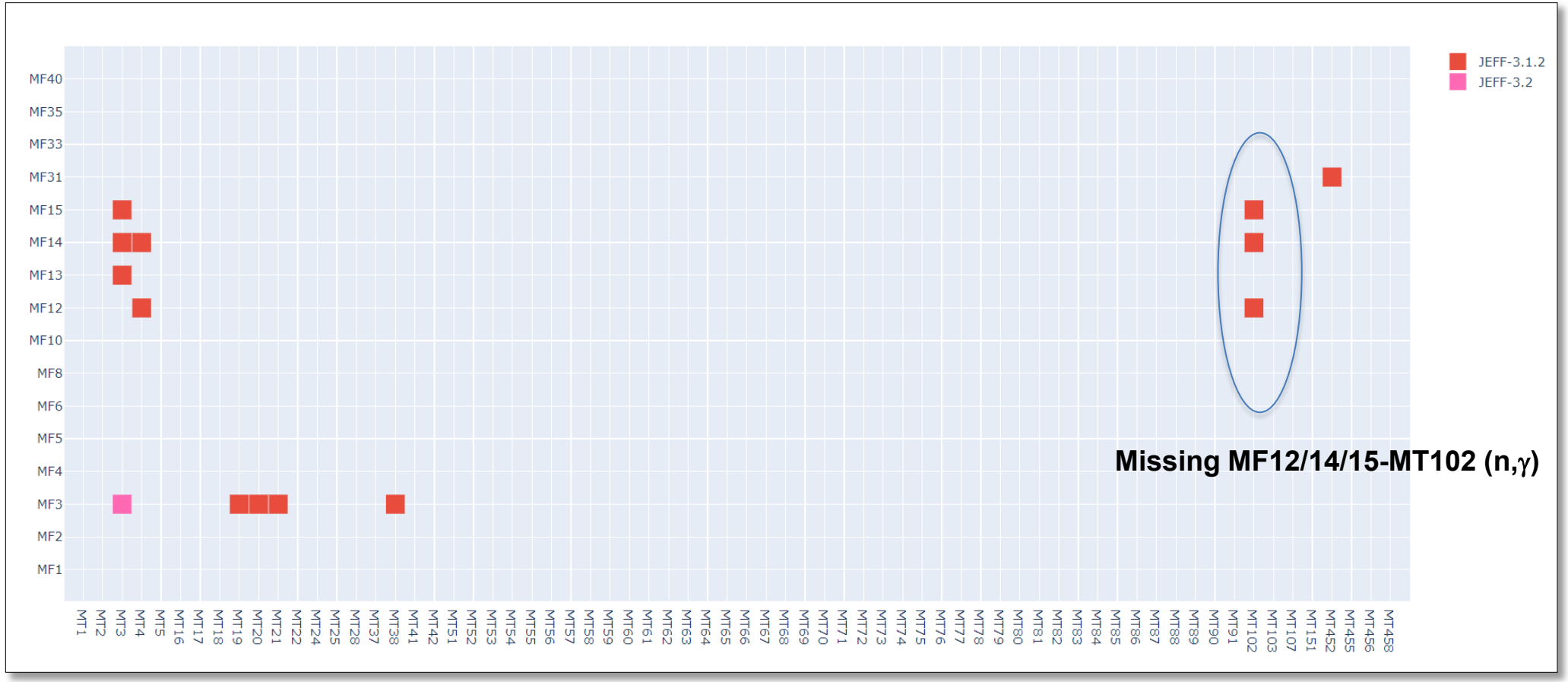
- ❑ Creates a file identifying de data tracking/origin for any MFs/MTs using 29 ENDFs
- ❑ Visualization



Mapping for 92-U-235

Programs

❑ **"UPM-INGENIA Mapping"** … searching lost MFs/MTs in previous **JEFF evaluations!!!**



Mapping of lost data for 92-U-235

Results

- Origin of ND evaluations of JEFF-4.0T2.2:

Evaluation	#	#	Comments
2023-JEFF-4T2.2	**172**	18	FULL NEW JEFF-4T2.2 Evaluations
		4	FULL MIX EVALUATION (no JEFF-4T2.2 contributions)
		150	MIX EVALUATIONS with JEFF-4T2.2 contributions
2005-JEFF-3.1	1	392	
2011-ENDFB7.1	6		
2014-JEFF-3.2	5		
2016-JENDL-4.0u	16		
2017-JEFF-3.3	46		
2018-ENDFB-8.0	7		
2021-JENDL-5.0	1		
2021-TENDL-2021	310		
Total JEFF-4T2.2 evaluations	**564**		

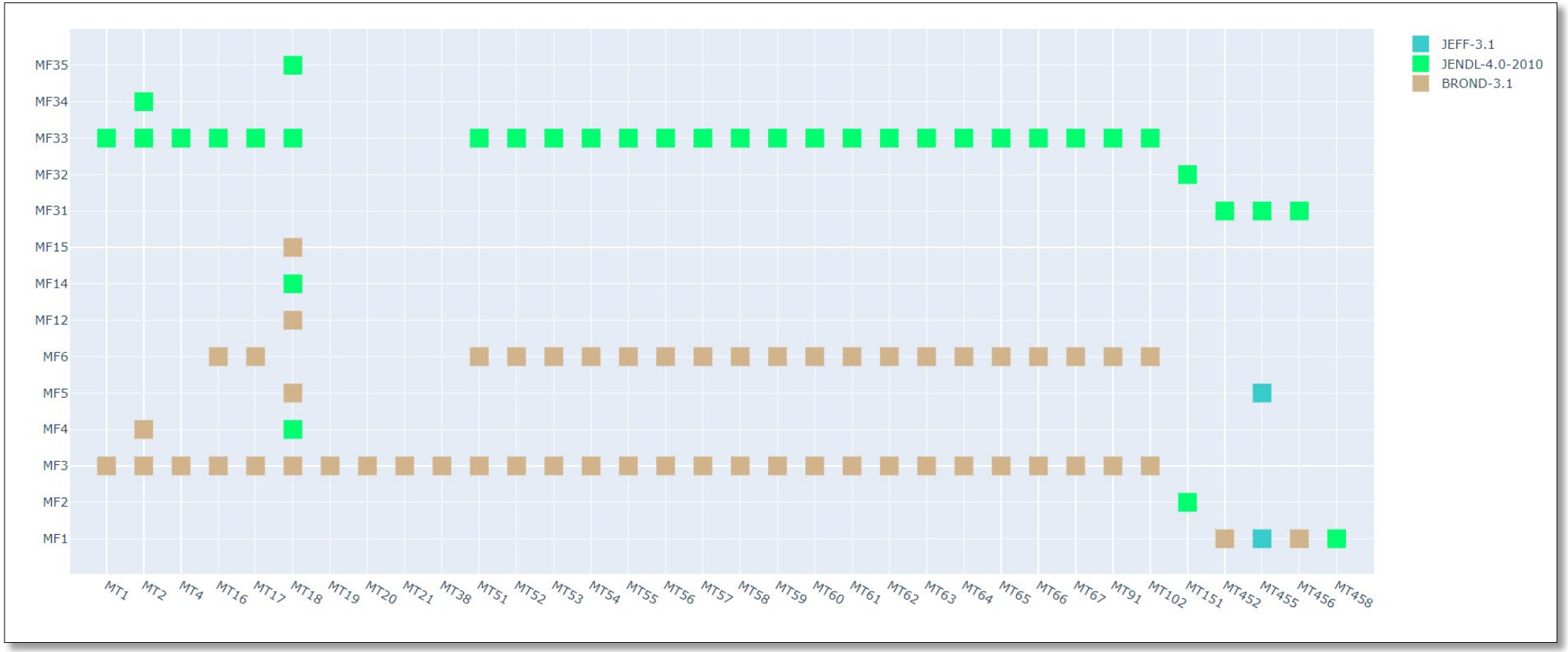
Results

❑ Origin of ND evaluations of JEFF-4.0T2.2

#	Comments	
18	FULL NEW JEFF-4T2.2 Evaluations	25-mn-52g 27-co-58g 41-nb-94g 41-nb-95g 46-pd-107g 47-ag-109g 47-ag-110g 54-xe-135g 55-cs-135g 56-ba-135g 56-ba-137g 61-pm-148g 63-eu-152g 63-eu-154g 77-ir-191g 77-ir-193g 78-pt-193g 95-am-242g
4	FULL MIX EVALUATION (no JEFF-4T2.2 contributions)	83-bi-209g **92-u-232g** 95-am-244m 98-cf-249g
150	MIX EVALUATIONS with JEFF-4T2.2 contributions	13-al-26g 13-al-27g 14-si-28g 14-si-29g 14-si-30g 21-sc-44g 21-sc-46g 22-ti-48g 22-ti-50g 24-cr-50g 24-cr-52g 24-cr-53g 24-cr-54g 25-mn-55g 26-fe-54g 26-fe-56g 26-fe-57g 26-fe-58g 27-co-60g 28-ni-58g 28-ni-59g 28-ni-60g 28-ni-61g 28-ni-64g 29-cu-63g 29-cu-65g 34-se-77g 34-se-79g 35-br-77g 35-br-79g 35-br-82g 36-kr-83g 36-kr-85g 37-rb-86g 38-sr-83g 38-sr-85g 38-sr-87g 39-y-87g 39-y-89g 39-y-90g 39-y-91g 40-zr-89g 41-nb-91g 41-nb-92g 41-nb-93g 42-mo-93g 43-tc-96g 43-tc-97g 43-tc-99g 45-rh-101g 45-rh-102g 45-rh-103g 45-rh-104g 45-rh-105g 45-rh-99g 47-ag-107g 47-ag-108g 47-ag-111g 49-in-114g 50-sn-121g 50-sn-123g 50-sn-125g 51-sb-122g 51-sb-124g 51-sb-126g 52-te-121g 52-te-123g 52-te-125g 53-i-130g 54-xe-127g 54-xe-131g 55-cs-134g 55-cs-136g 56-ba-131g 56-ba-133g 57-la-139g 58-ce-137g 58-ce-139g 59-pr-142g 5-b-10g 5-b-11g 61-pm-148m 62-sm-151g 63-eu-151g 63-eu-152m 63-eu-153g 63-eu-155g 64-gd-155g 64-gd-156g 64-gd-157g 64-gd-158g 64-gd-160g 65-tb-158g 66-dy-165g 67-ho-163g 68-er-167g 69-tm-171g 70-yb-169g 70-yb-176g 71-lu-173g 71-lu-174g 71-lu-175g 71-lu-176g 71-lu-177g 72-hf-174g 72-hf-176g 72-hf-177g 72-hf-178g 72-hf-179g 72-hf-180g 72-hf-182g 73-ta-181g 73-ta-182g 74-w-180g 74-w-182g 74-w-183g 74-w-184g 74-w-185g **74-w-186g** 75-re-186g 75-re-188g 76-os-186g 76-os-187g 76-os-188g 76-os-189g 76-os-190g 76-os-191g 76-os-192g 77-ir-190g 77-ir-192g 78-pt-195g 80-hg-199g 82-pb-204g 83-bi-210g 8-o-16g 8-o-18g **92-u-233g** 92-u-235g 92-u-236g 92-u-238g 93-np-237g 94-pu-238g 94-pu-239g 94-pu-240g 94-pu-242g 95-am-241g 95-am-243g 95-am-244g 99-es-254g 9-f-19g

Results

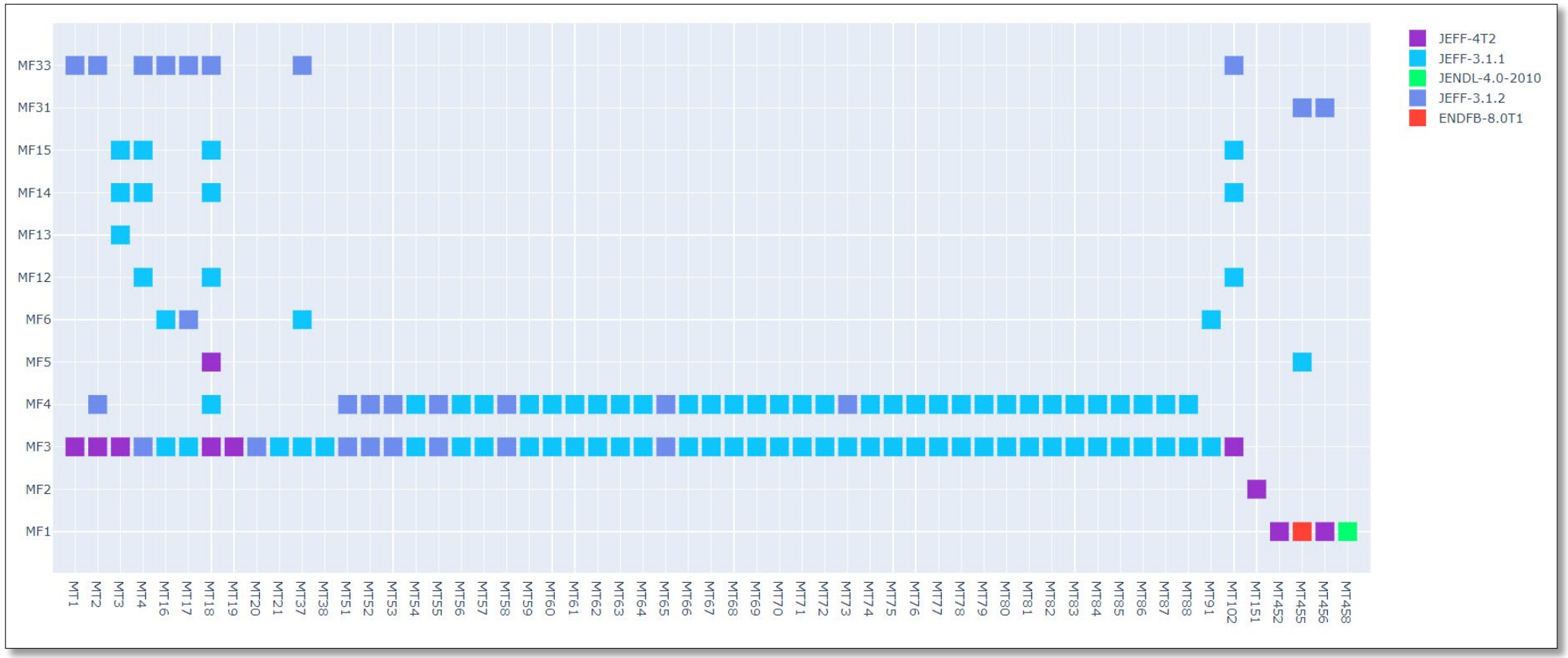
❑ Case **“FULL MIX EVALUATION (no JEFF-4T2.2 contributions)”** : **232U**



Mapping for 92-U-232

Results

❑ Case **“MIX EVALUATIONS with JEFF-4T2.2 contributions”** : **233U**



Mapping for 92-U-233

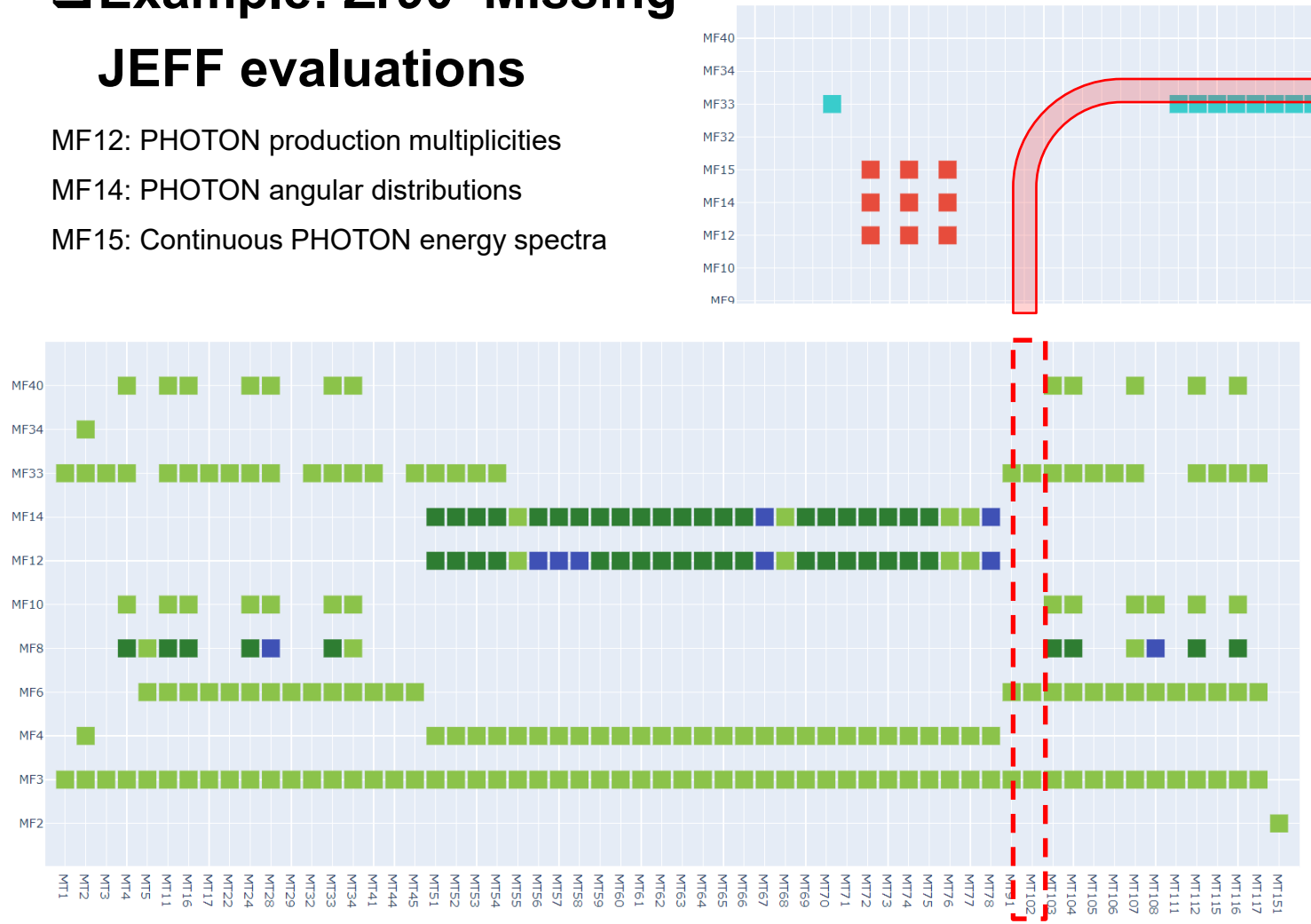
Results

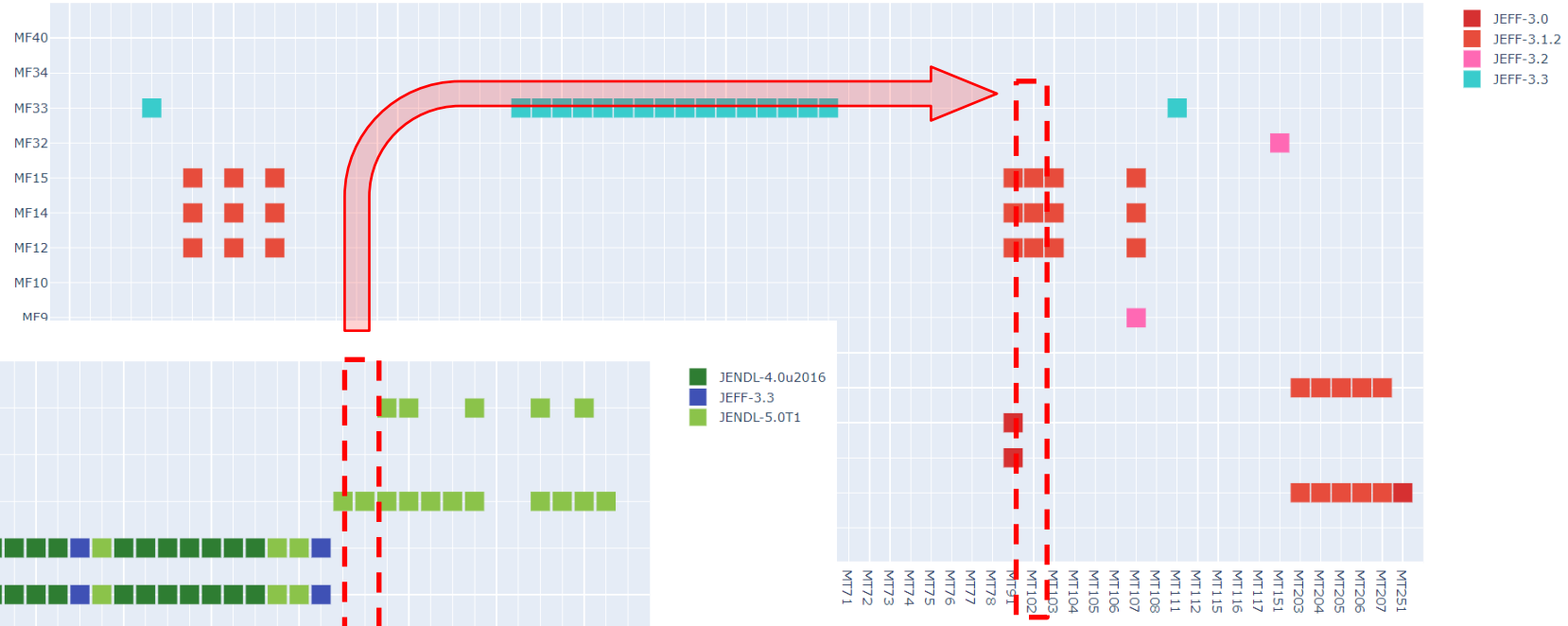
❑ Example: Zr90 Missing JEFF evaluations

MF12: PHOTON production multiplicities

MF14: PHOTON angular distributions

MF15: Continuous PHOTON energy spectra





Missing MF12/14/15-MT102 (n,γ)

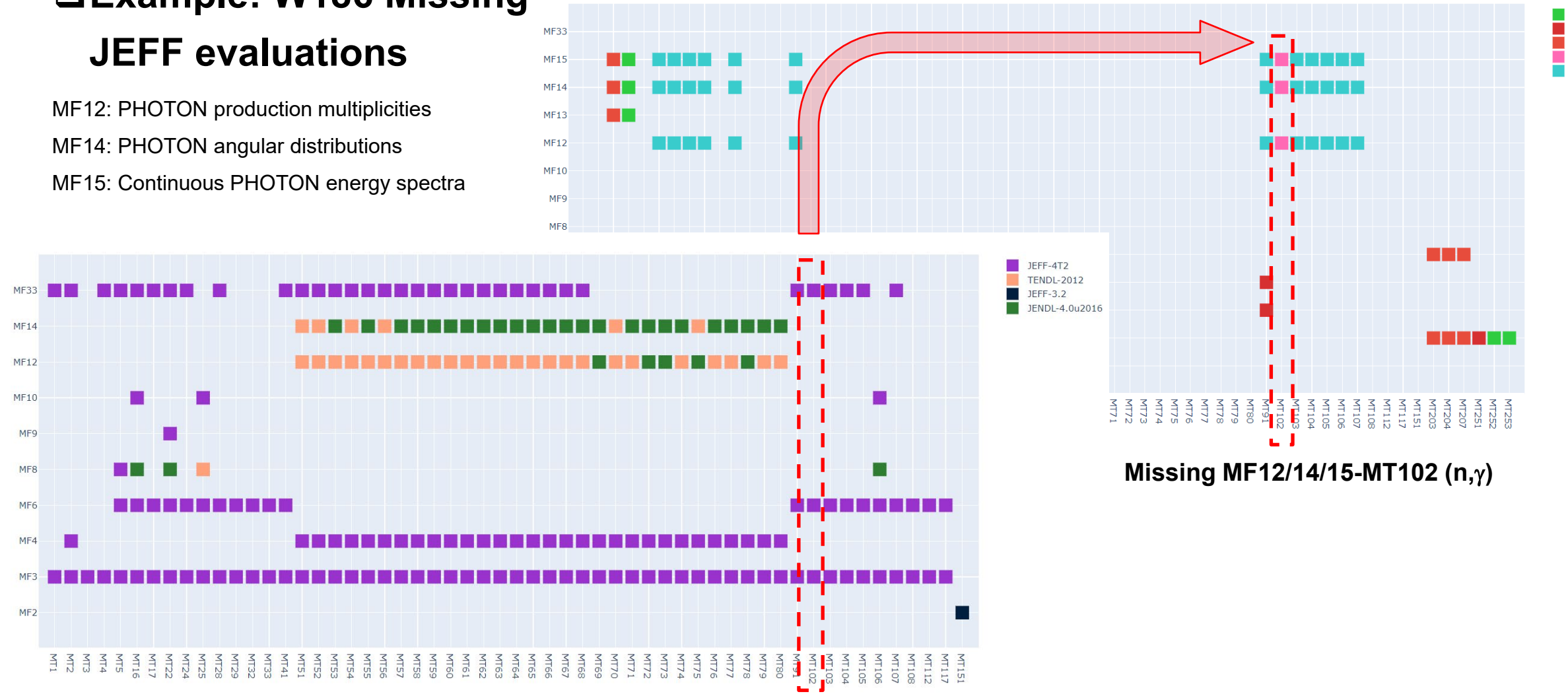
Results

❑ Example: W186 Missing JEFF evaluations

MF12: PHOTON production multiplicities

MF14: PHOTON angular distributions

MF15: Continuous PHOTON energy spectra



Missing MF12/14/15-MT102 (n,γ)

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Thanks for your attention