

Status of $^{238}\text{U}(n,\gamma)$ with the C_6D_6

F. Mingrone

n_TOF Collaboration Meeting
Bologna – November 27, 2013

Radiative capture on ^{238}U campaign

SAMPLE	DATE (YEAR 2012)	PROTONS
^{238}U	10 d: March 29 – April 03, April 25 – 27, April 30 – May 02; <u>Filters</u> – 7 d: April 5 – 6, April 11 – 16	$7.85 \times 10^{17} +$ 1.2×10^{18}
Sample Out	6 d: March 28 – 2; 11 d: April 9 – 11	$6.271 \times 10^{16} +$ 1.14×10^{17}
^{238}U packing	2 d: April 21 – 22	9.65×10^{16}
Beam off	0.25 d: March 28, April 5, April 11	
Calibrations	0.25 d: March 28, April 5, April 11	
Pb	2d: April 03 – 04; <u>Filters</u> – 2 d: April 8 – 9	$1.50 \times 10^{17} +$ 1.53×10^{17}
C (5 mm)	3 d: April 4 – 5, April 17; <u>Filters</u> – 2 d: April 7 – 8	1.46×10^{17} $+ 1.66 \times 10^{17}$
C (10 mm)	2 d: April 19 – 20; <u>Filters</u> – 3 d: April 28 – 30	$9.71 \times 10^{16} +$ 1.11×10^{17}
Au (50 μm)	2 d: April 5, April 16	4.86×10^{16}
Au (300 μm)	2 d: April 17 – 18; <u>Filters</u> – 2 d: April 27 – 28	$8.33 \times 10^{16} +$ 9.93×10^{16}
Ag	1 d: May 02	1.60×10^{16}

$^{238}\text{U}(n,\gamma)$ – TOT: 17 days

Radiative capture on ^{238}U campaign

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BACKGROUND – TOT: 14.5 days

Radiative capture on ^{238}U campaign

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C (5 mm)	3 d: April 4 – 5, April 17; <u>Filters</u> – 2 d: April 7 – 8	$1.46 \times 10^{17} + 1.66 \times 10^{17}$
C (10 mm)	2 d: April 19 – 20; <u>Filters</u> – 2 d: April 16 – 15	$6.71 \times 10^{16} + 1.11 \times 10^{17}$
NORMALIZATION – TOT: 3.5 days		
Au (50 μm)	2 d: April 5, April 16	4.86×10^{16}
Au (300 μm)	2 d: April 17 – 18; <u>Filters</u> – 2 d: April 27 – 28	$8.33 \times 10^{16} + 9.93 \times 10^{16}$
Ag	1 d: May 02	1.60×10^{16}

Radiative capture on ^{238}U campaign

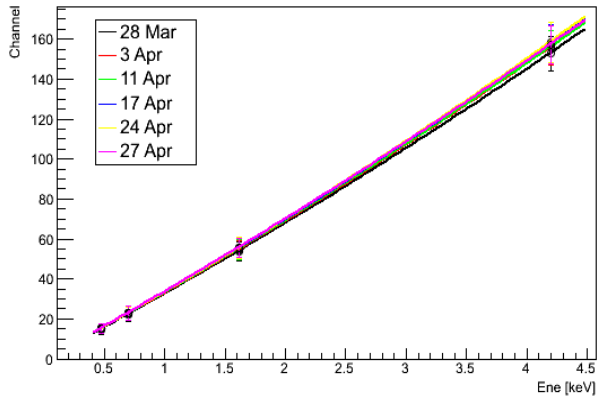
SAMPLE	DATE (YEAR 2012)	PROTONS
^{238}U	10 d: March 29 – April 03, April 25 – 27, April 30 – May 02; <u>Filters</u> – 7 d: April 5 – 6, April 11 – 16	$7.85 \times 10^{17} +$ 1.2×10^{18}
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Ag	1 d: May 02	1.60×10^{16}

ENTIRE CAMPAIGN: 35 days

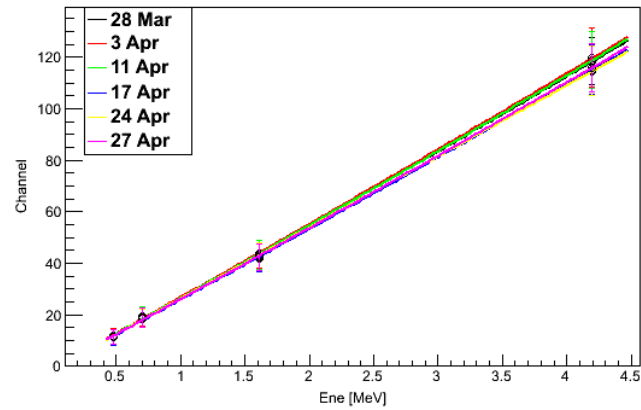
DATA REDUCTION

CALIBRATIONS

Calibration - BICRON



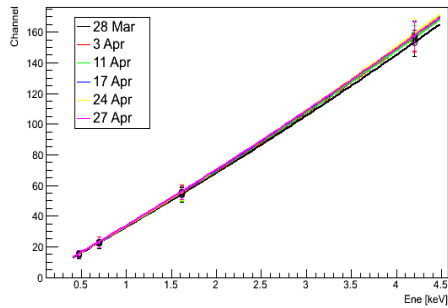
Calibration - FZK



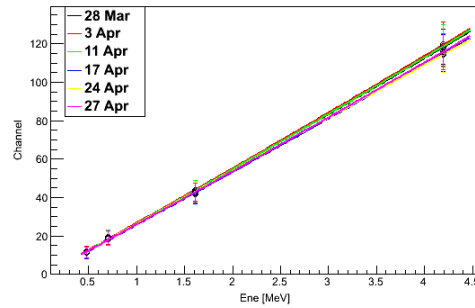
DATA REDUCTION

CALIBRATIONS

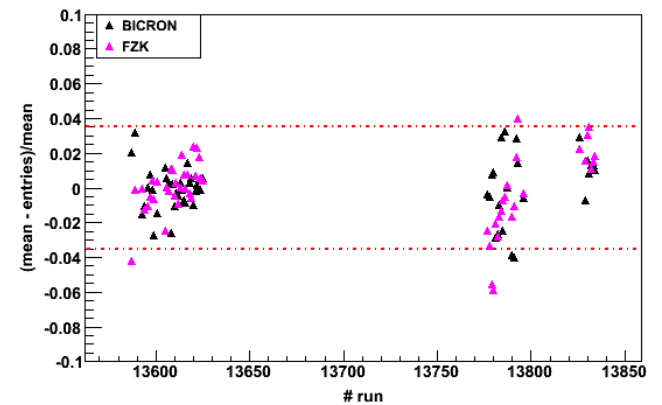
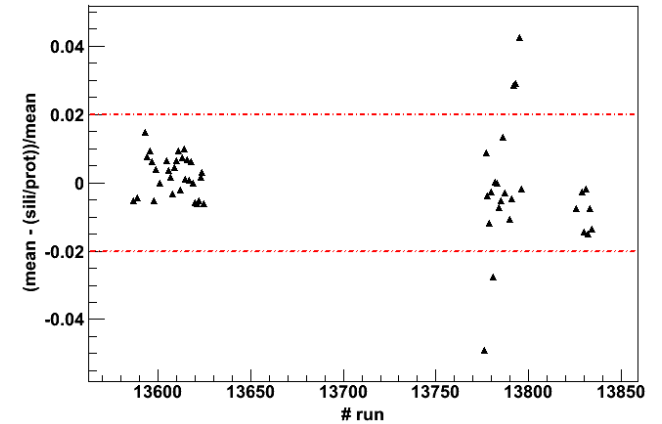
Calibration - BICRON



Calibration - FZK



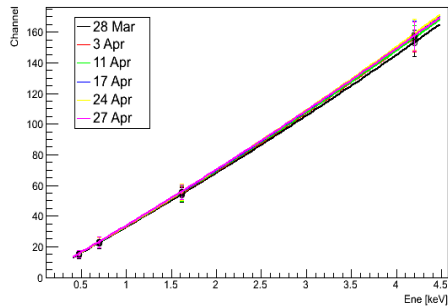
STABILITY CHECK



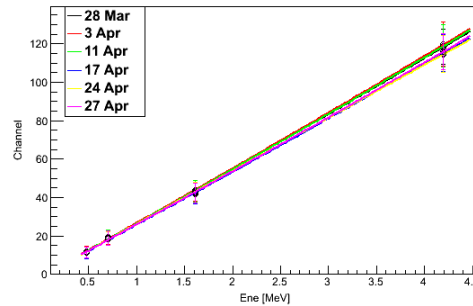
DATA REDUCTION

CALIBRATIONS

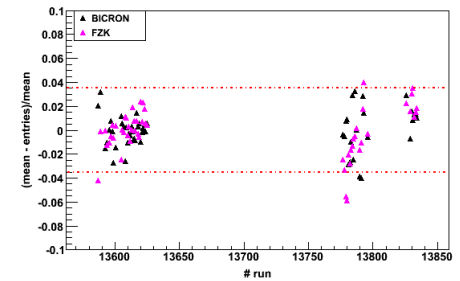
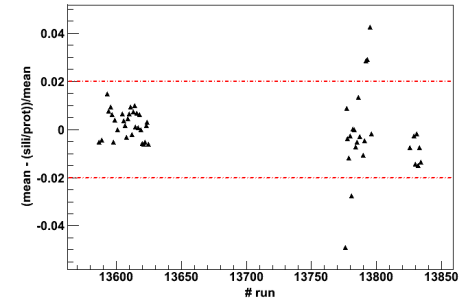
Calibration - BICRON



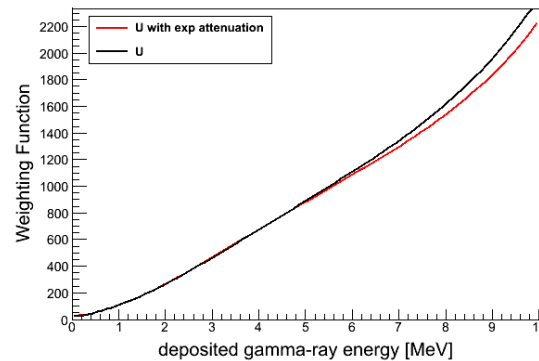
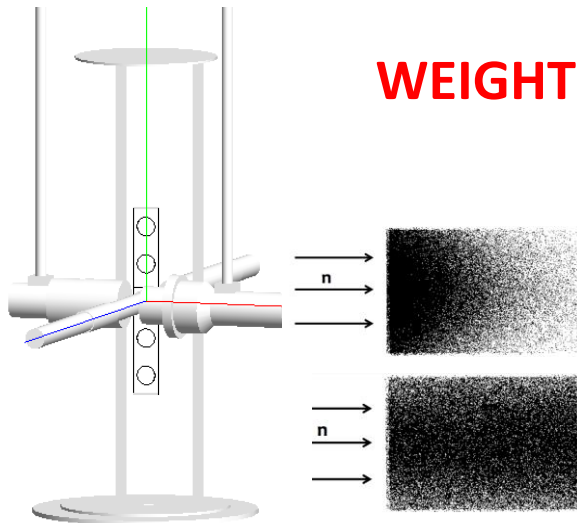
Calibration - FZK



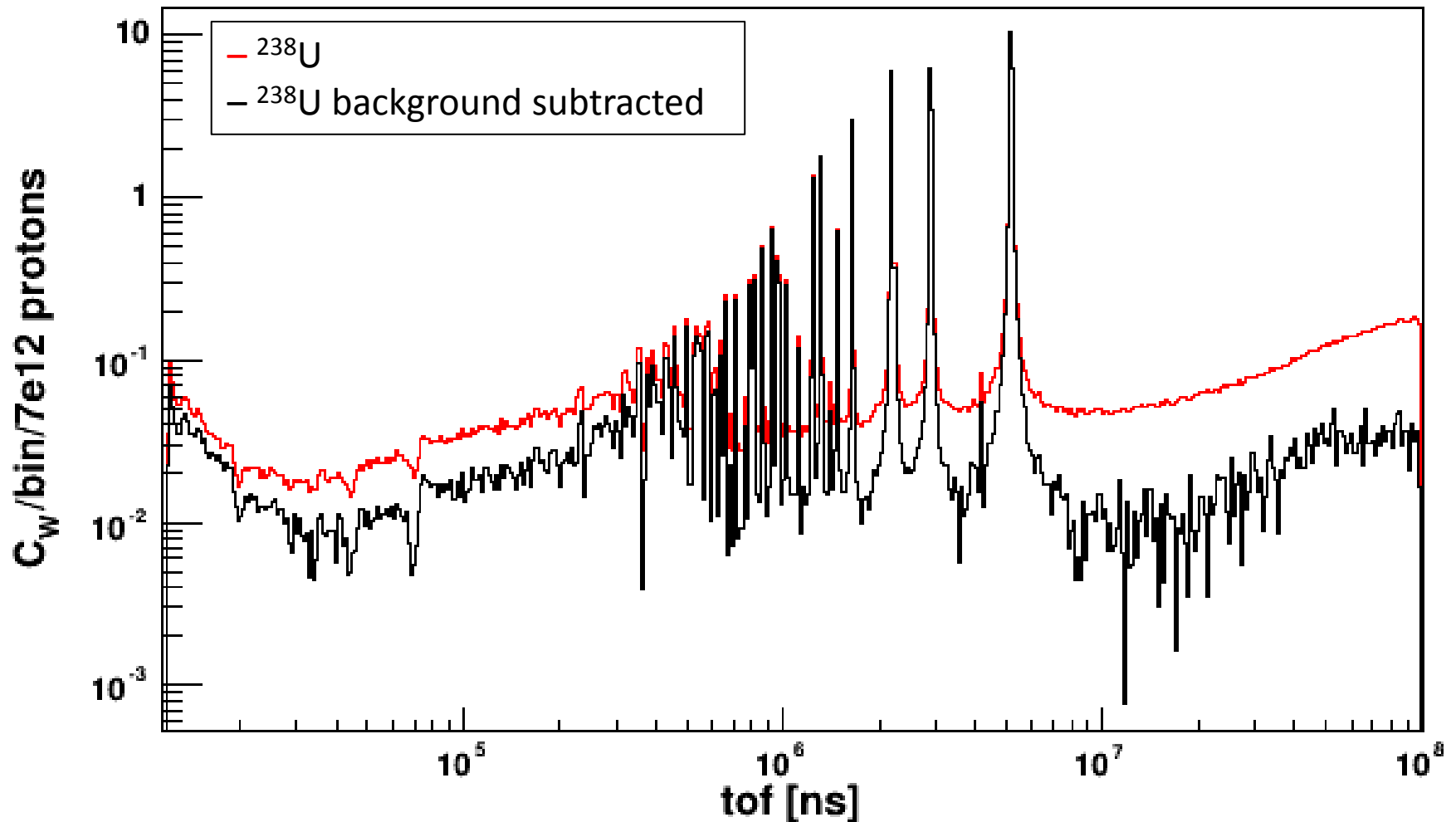
STABILITY CHECK



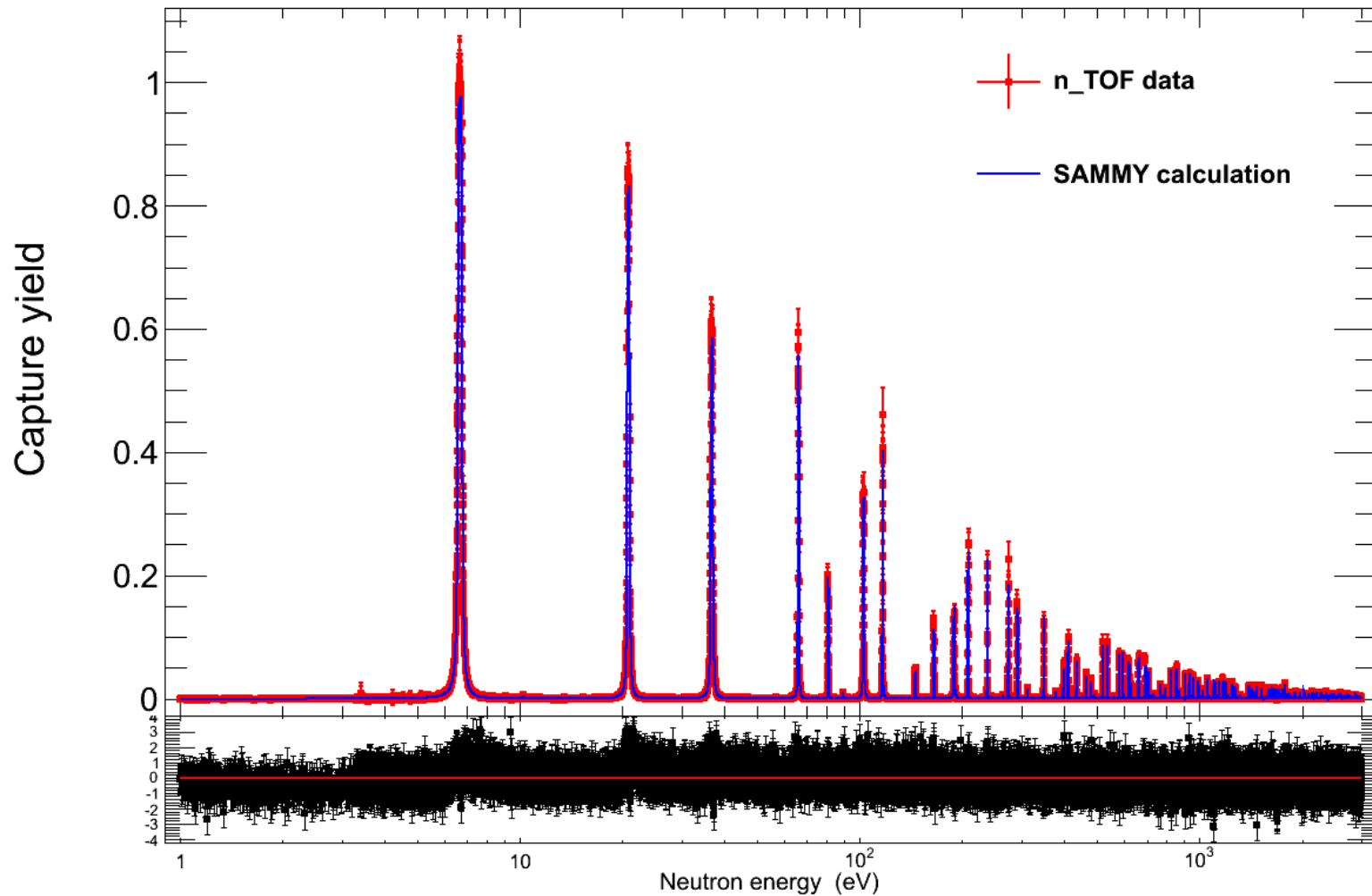
WEIGHTING FUNCTIONS



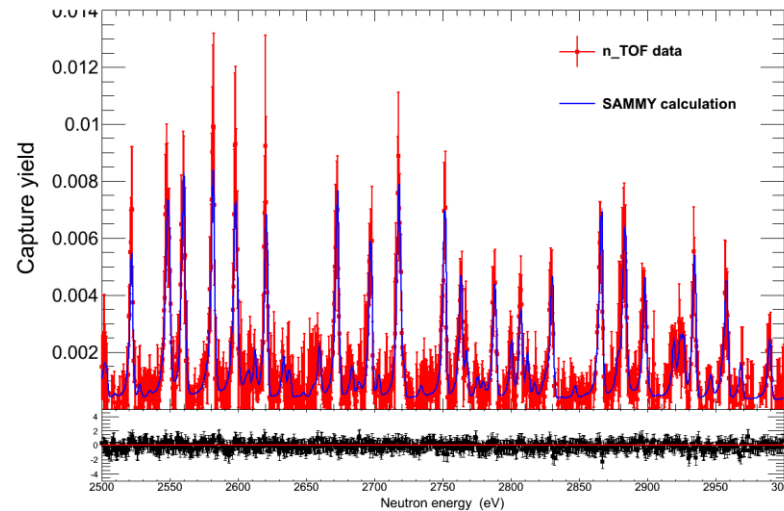
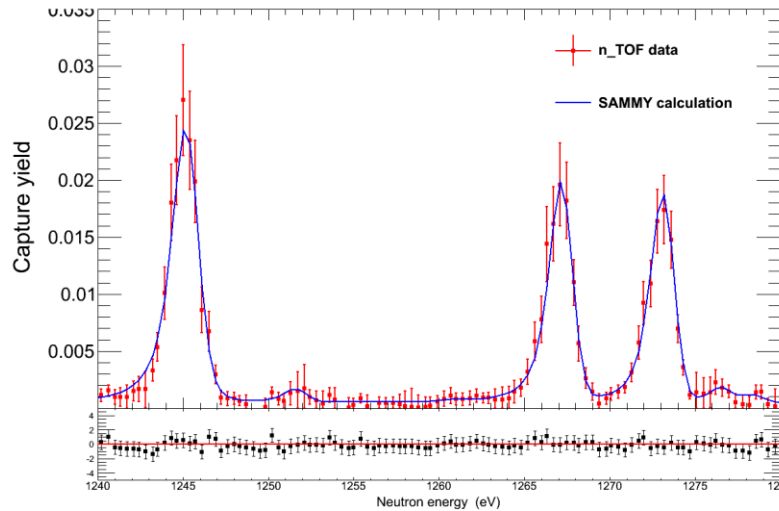
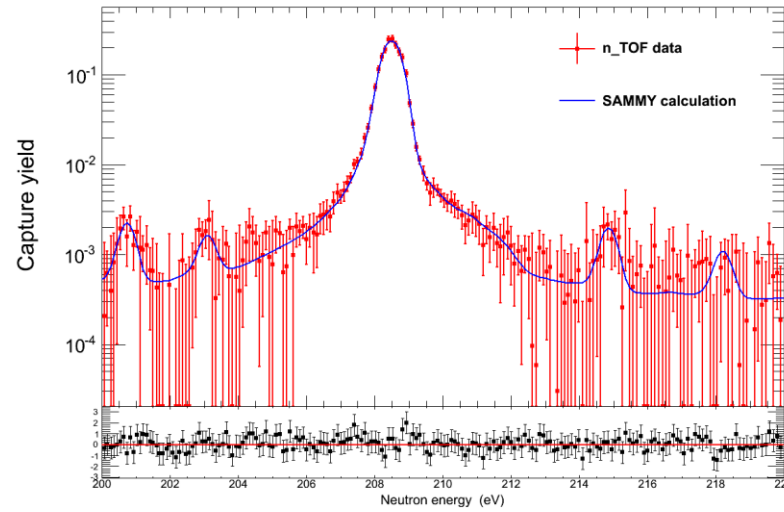
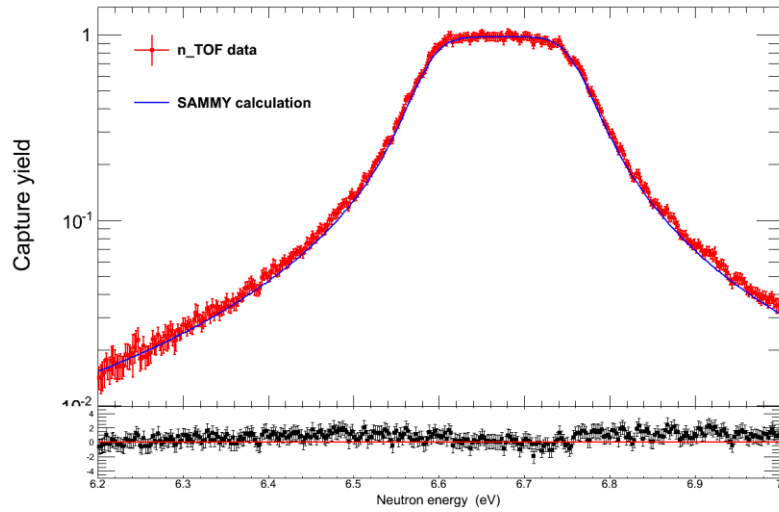
TOF SPECTRUM



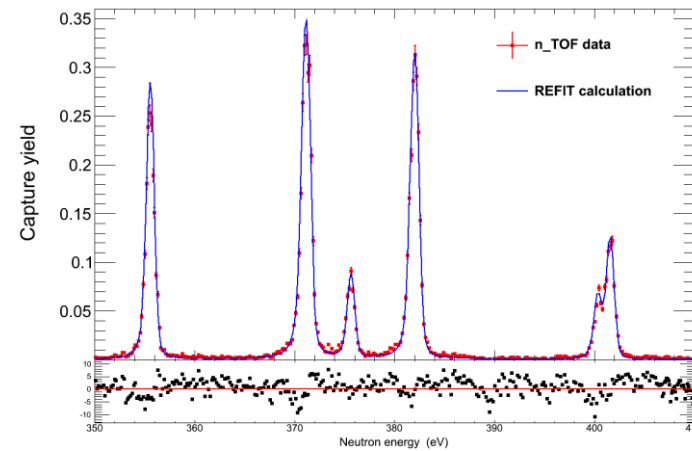
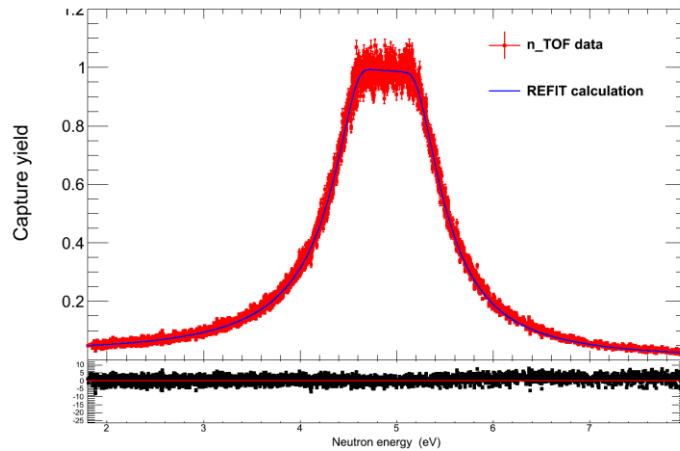
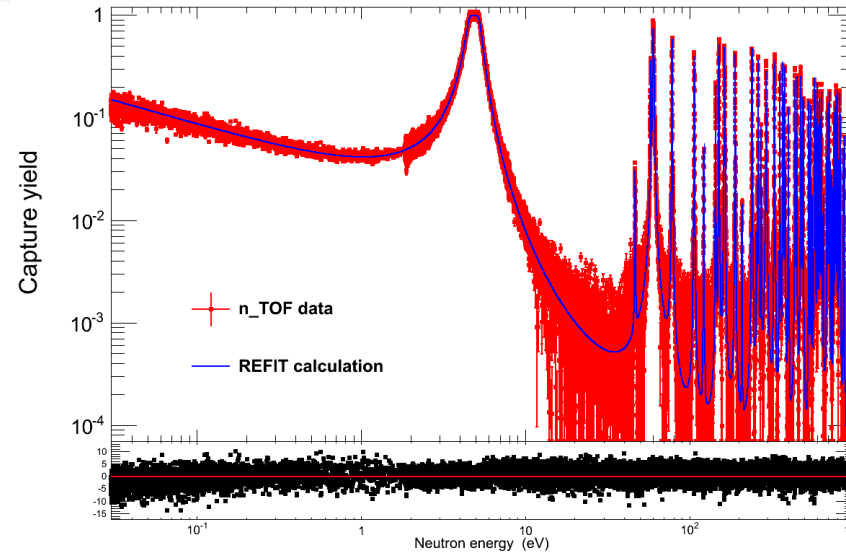
^{238}U CAPTURE YIELD



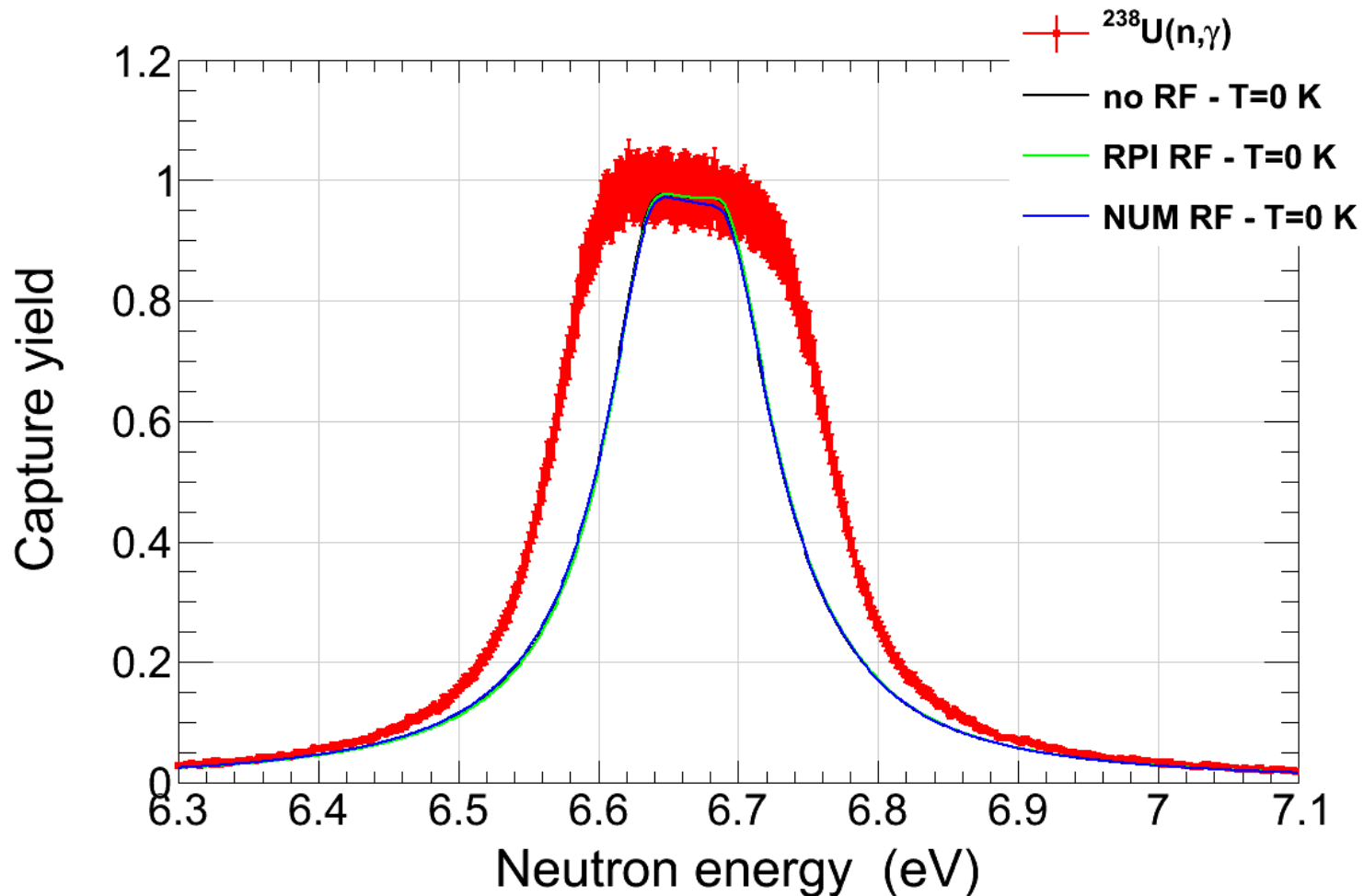
^{238}U CAPTURE YIELD



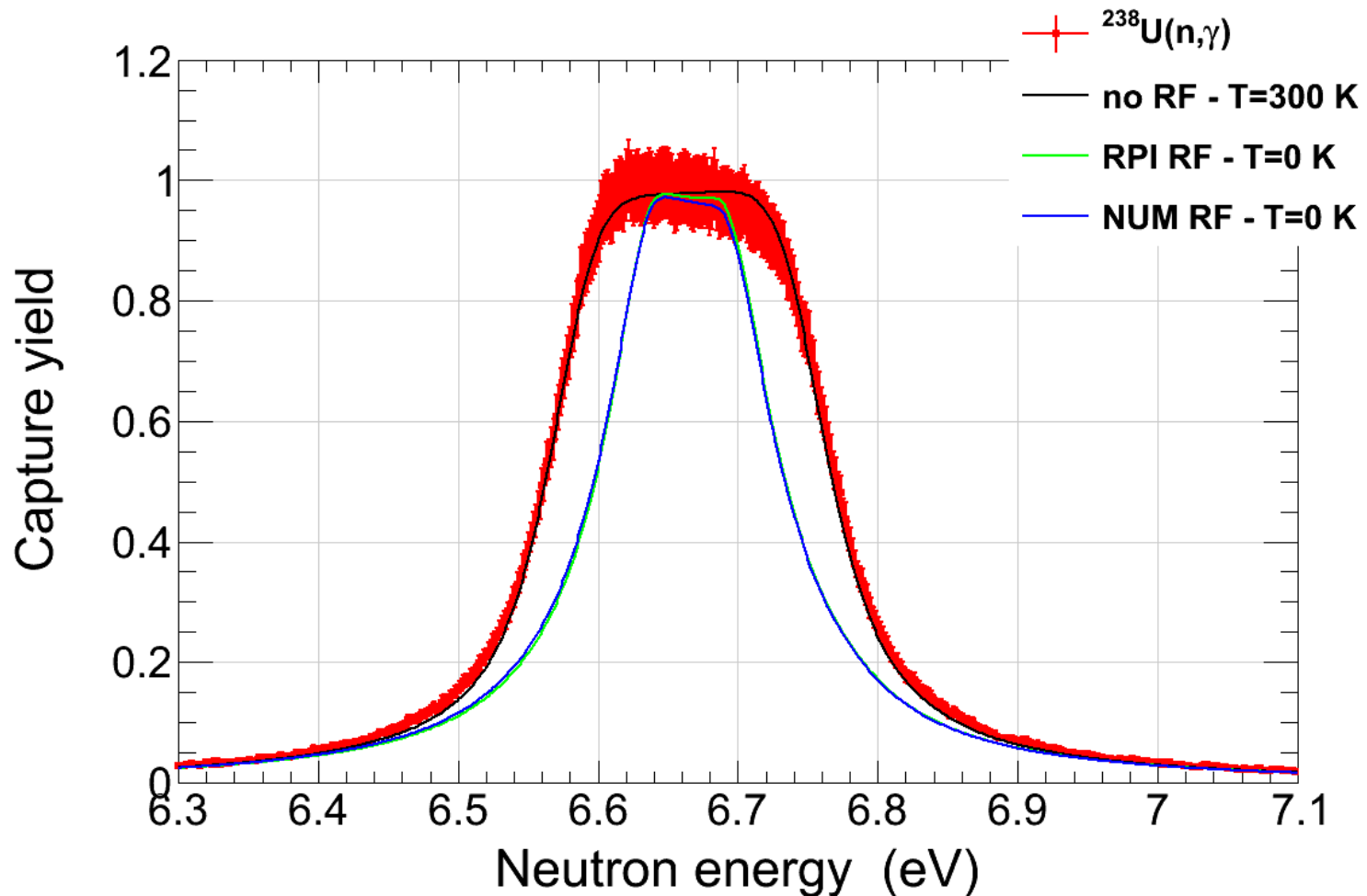
^{197}Au YIELD: analysis validation



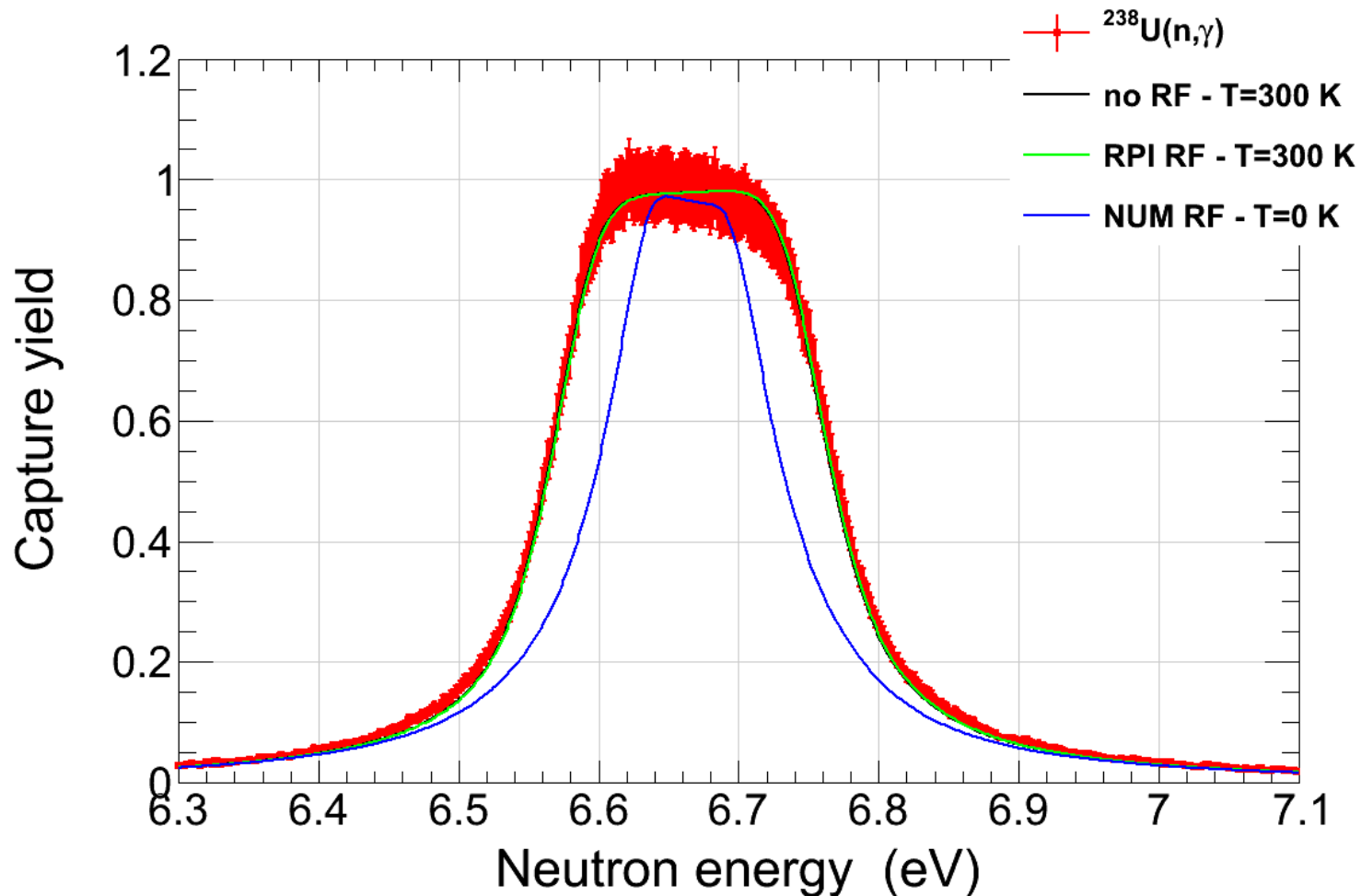
Phase-2 RESOLUTION FUNCTION



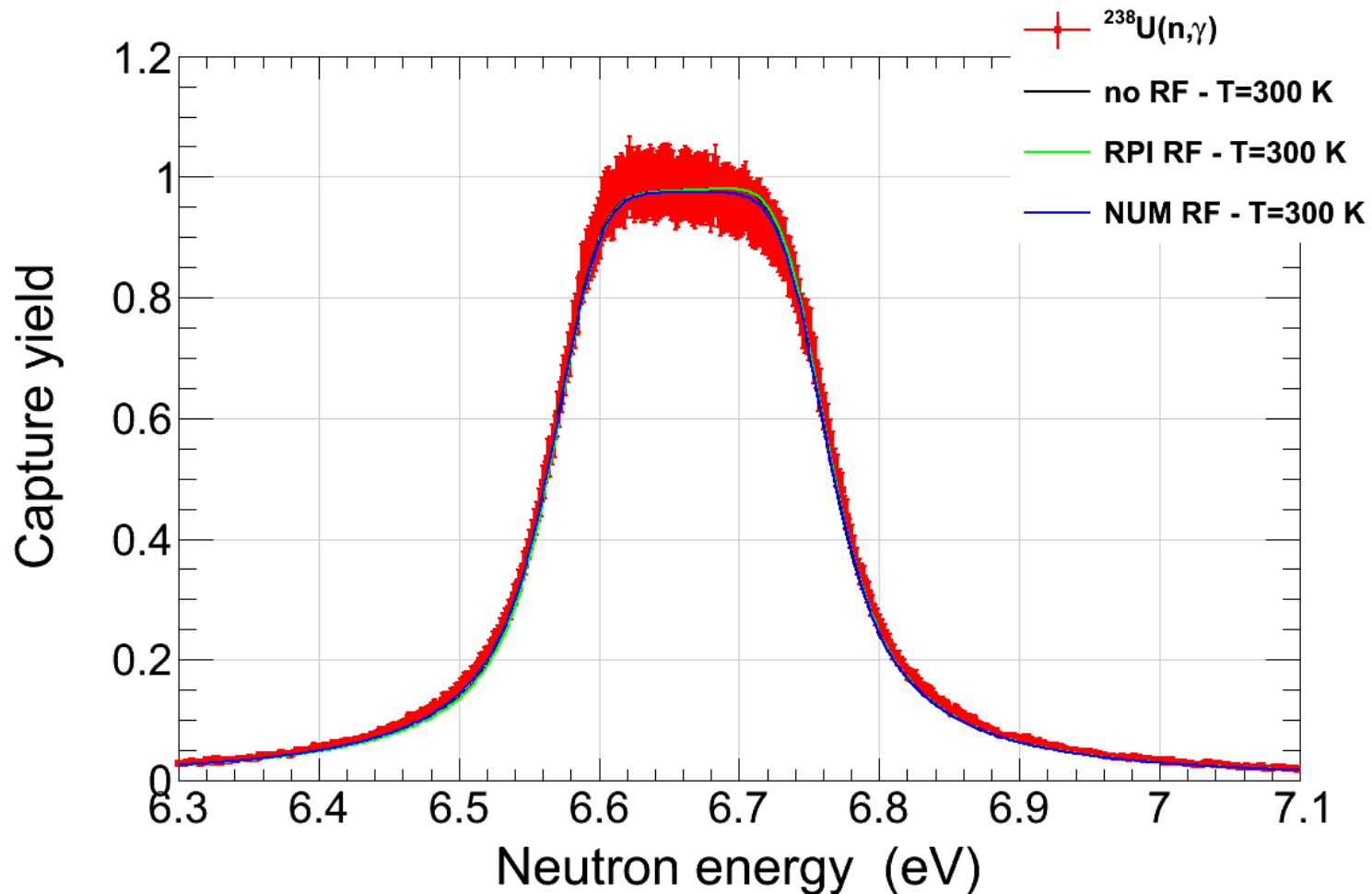
Phase-2 RESOLUTION FUNCTION



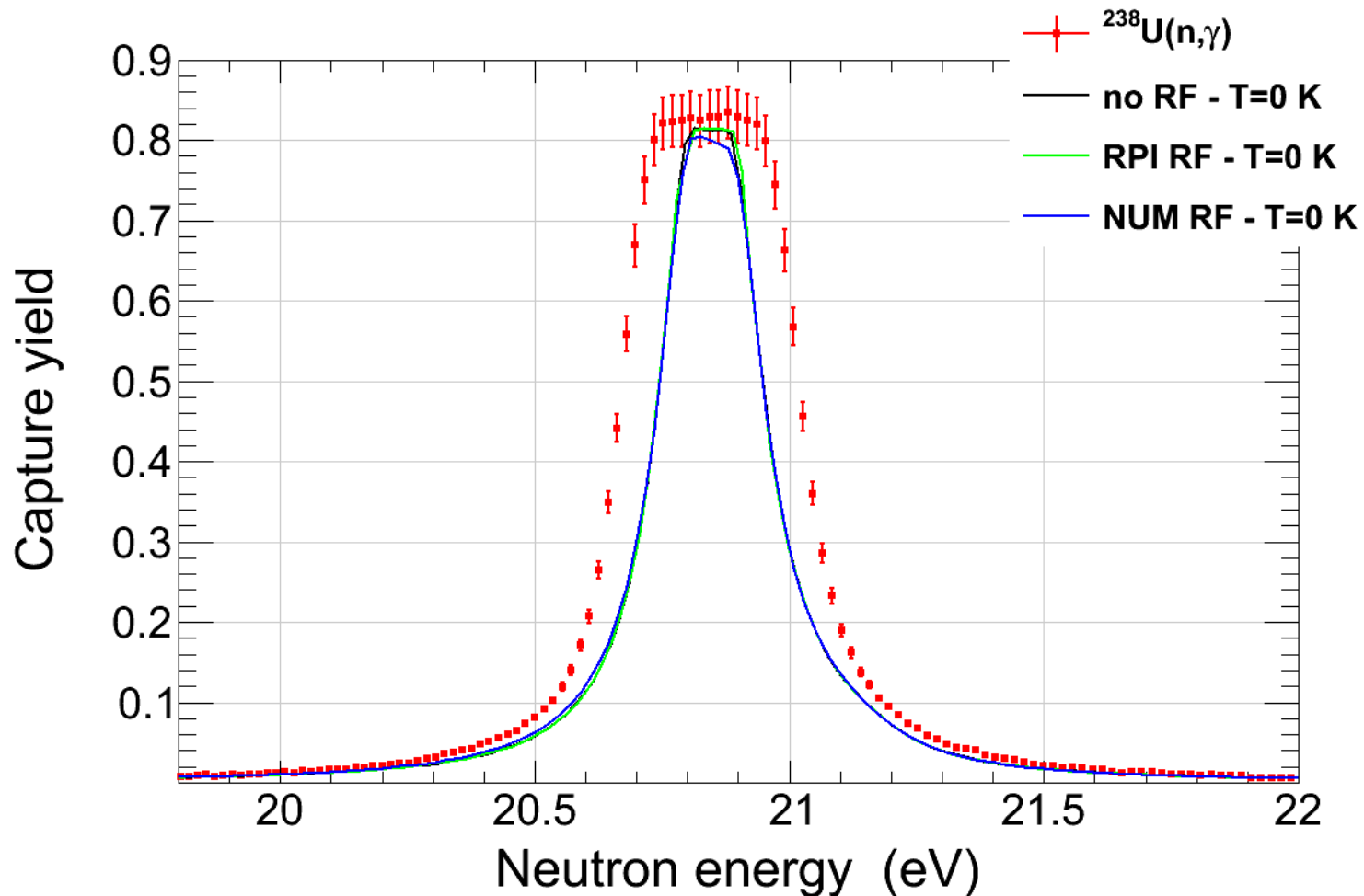
Phase-2 RESOLUTION FUNCTION



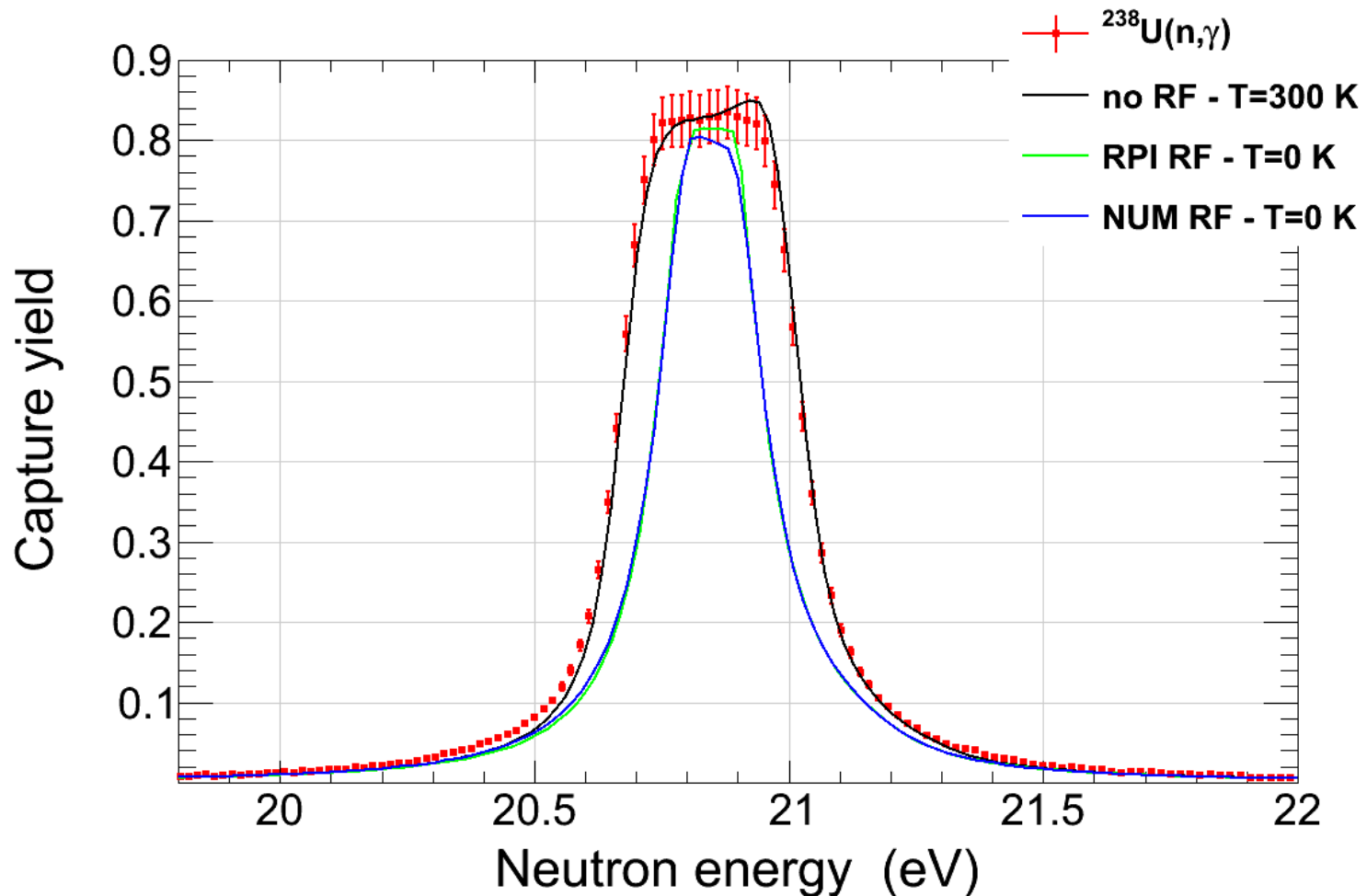
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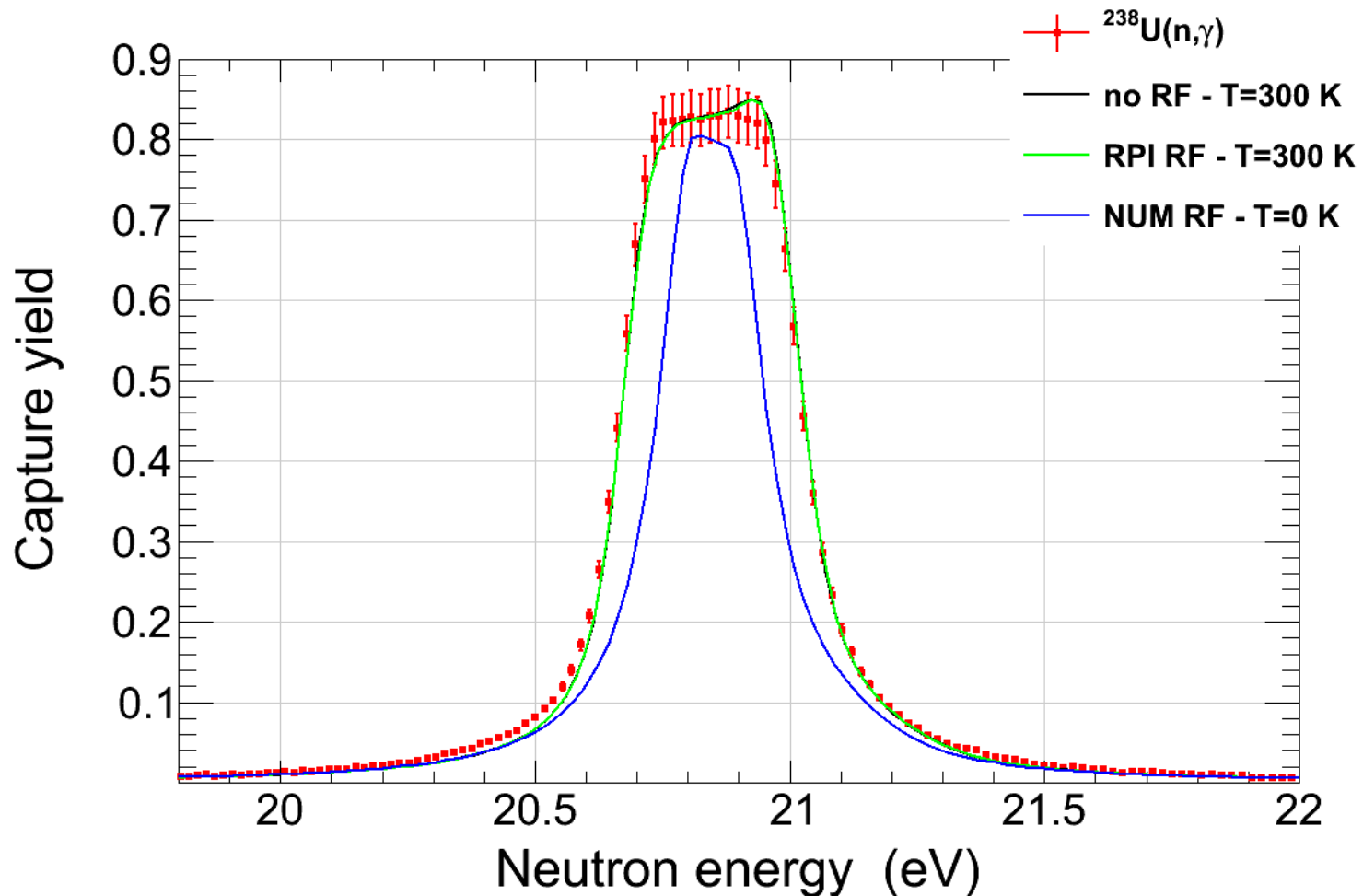
Phase-2 RESOLUTION FUNCTION



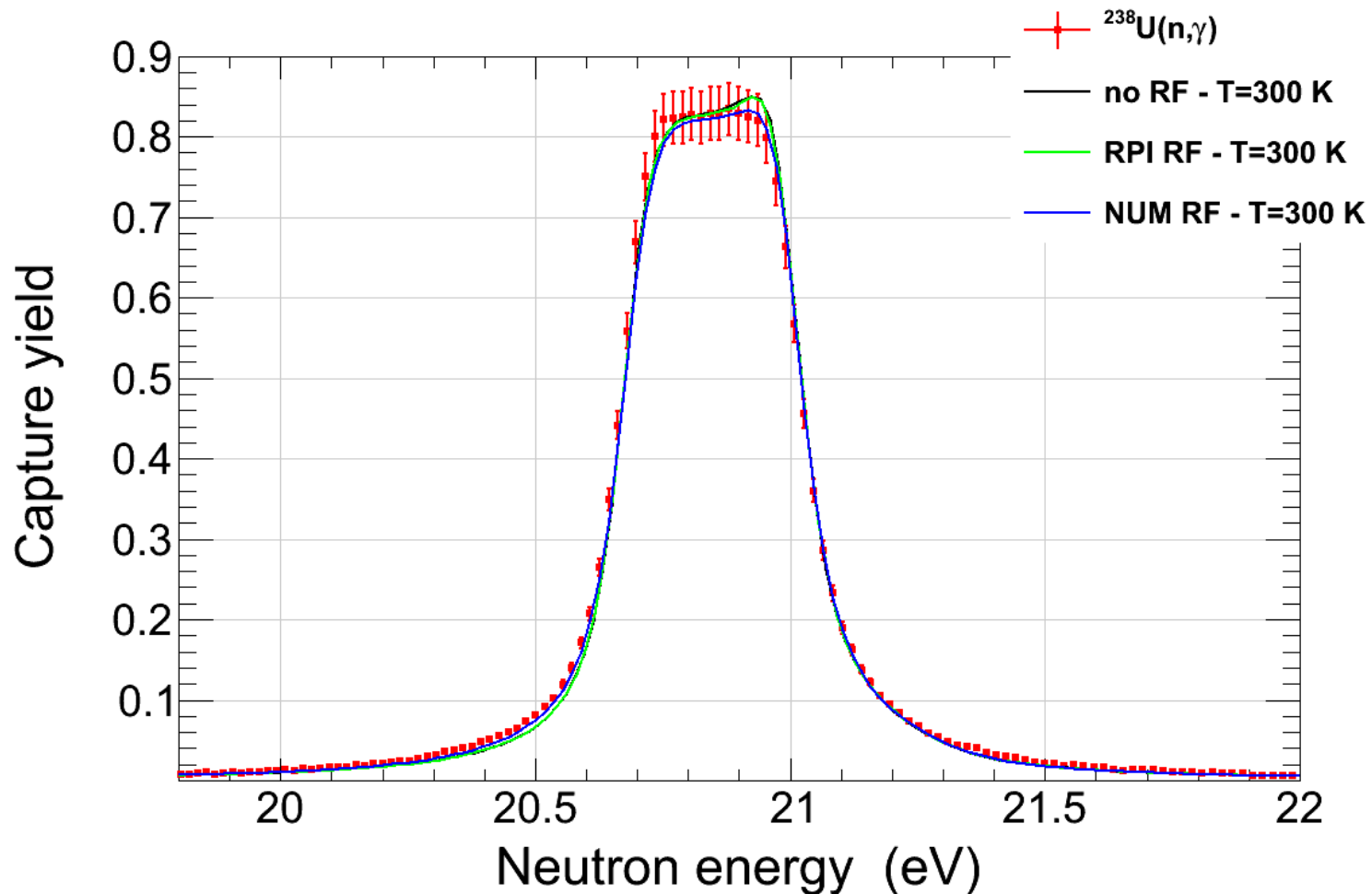
Phase-2 RESOLUTION FUNCTION



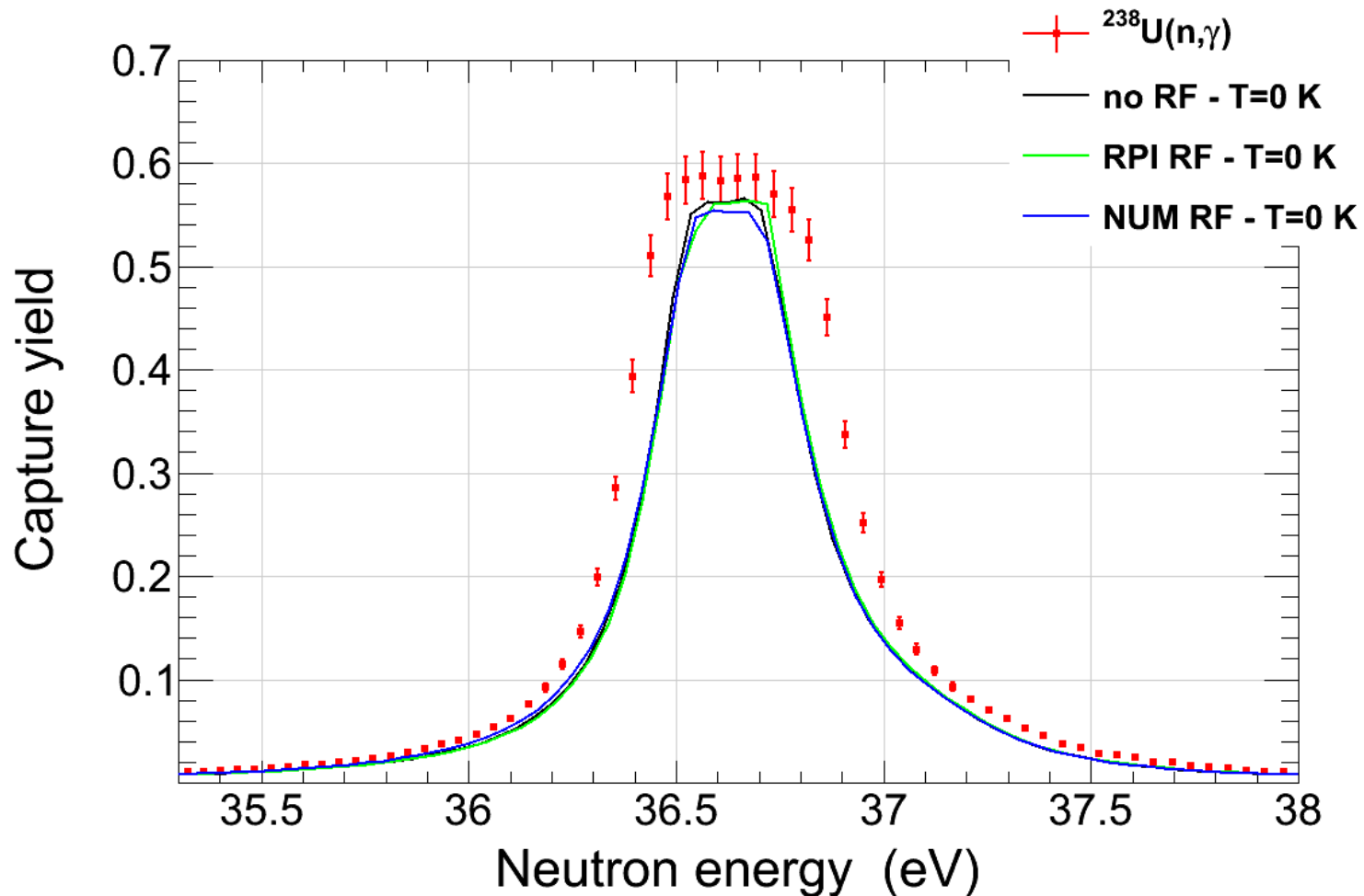
Phase-2 RESOLUTION FUNCTION



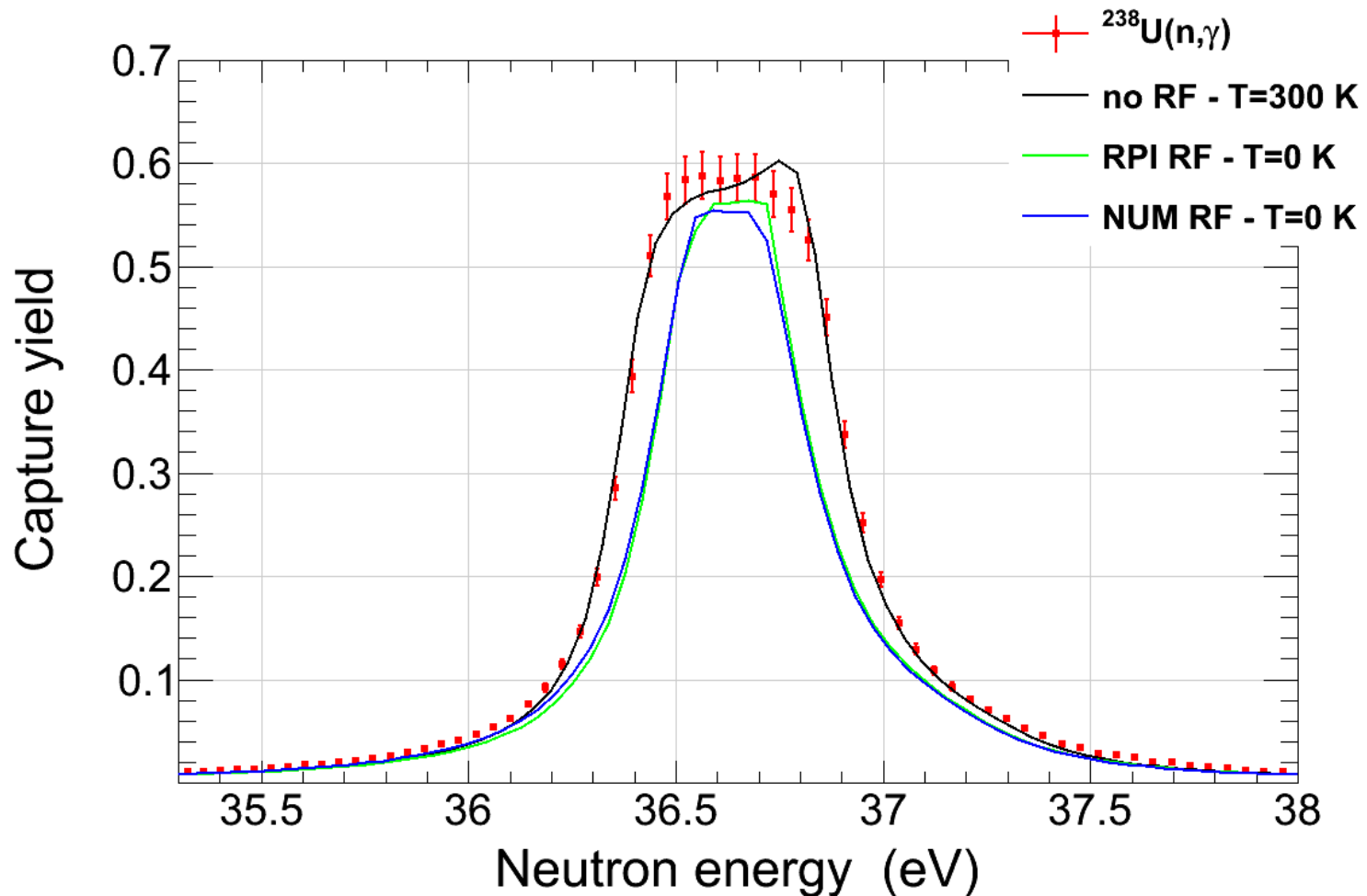
Phase-2 RESOLUTION FUNCTION



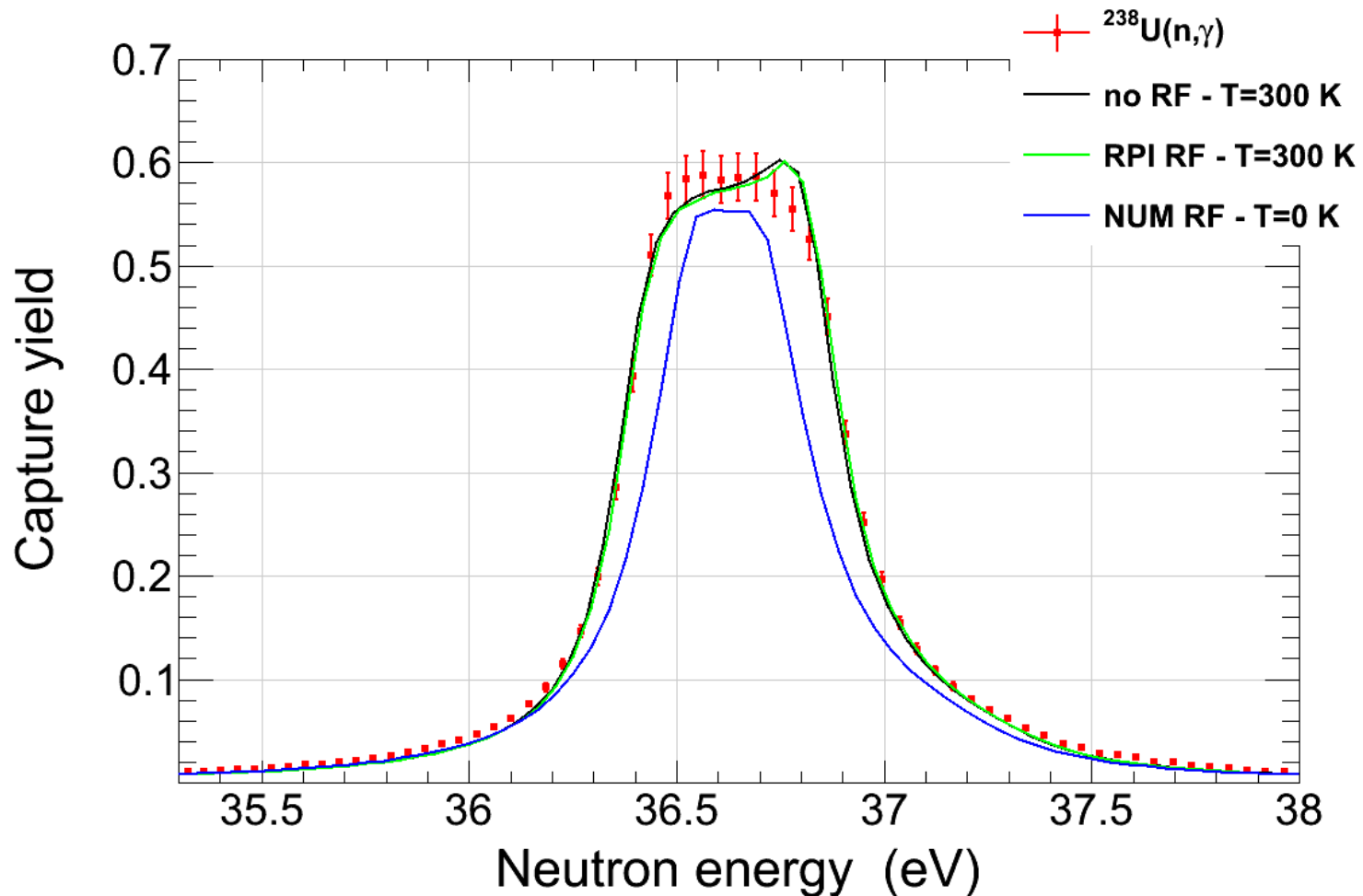
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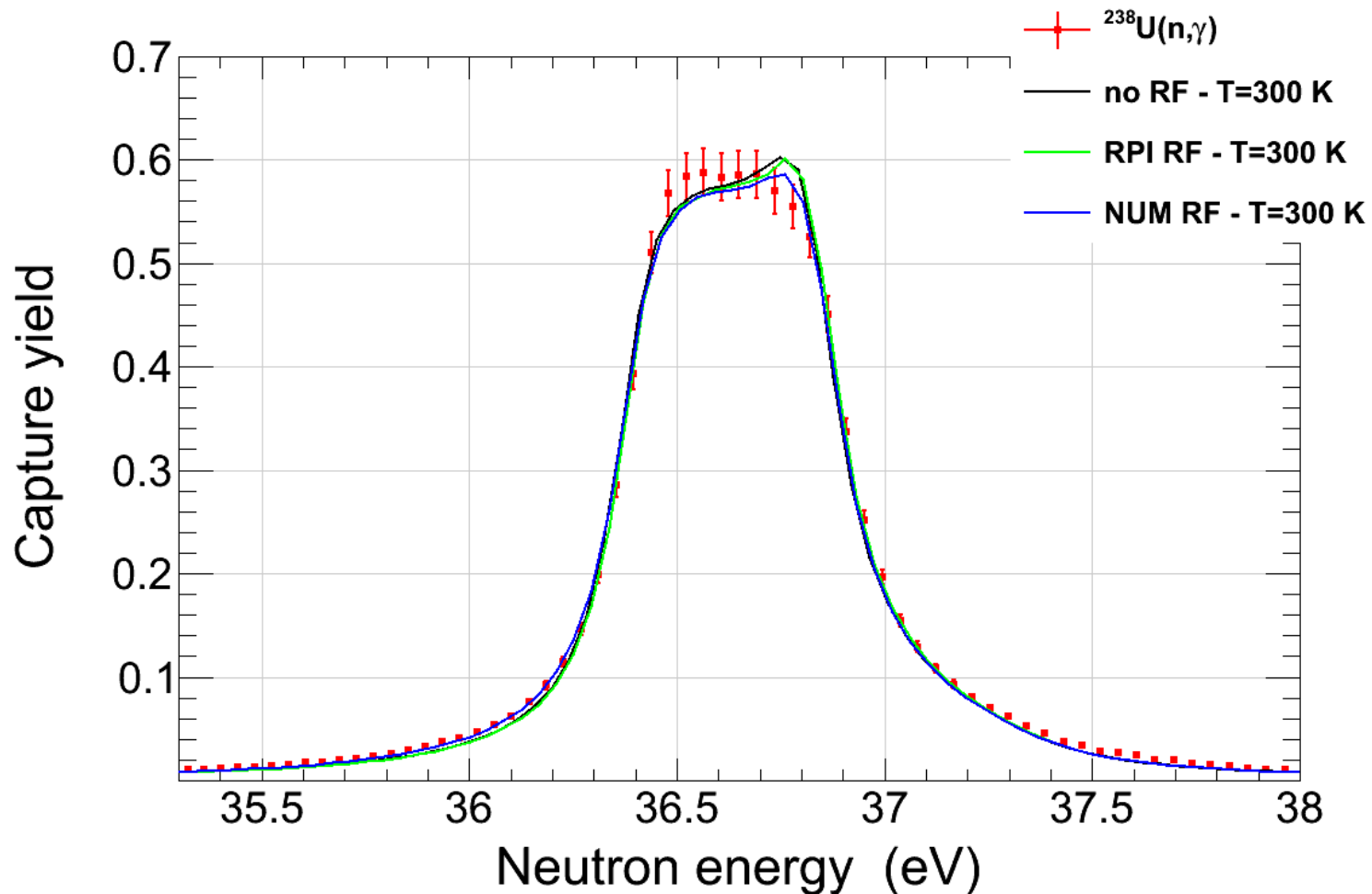
Phase-2 RESOLUTION FUNCTION



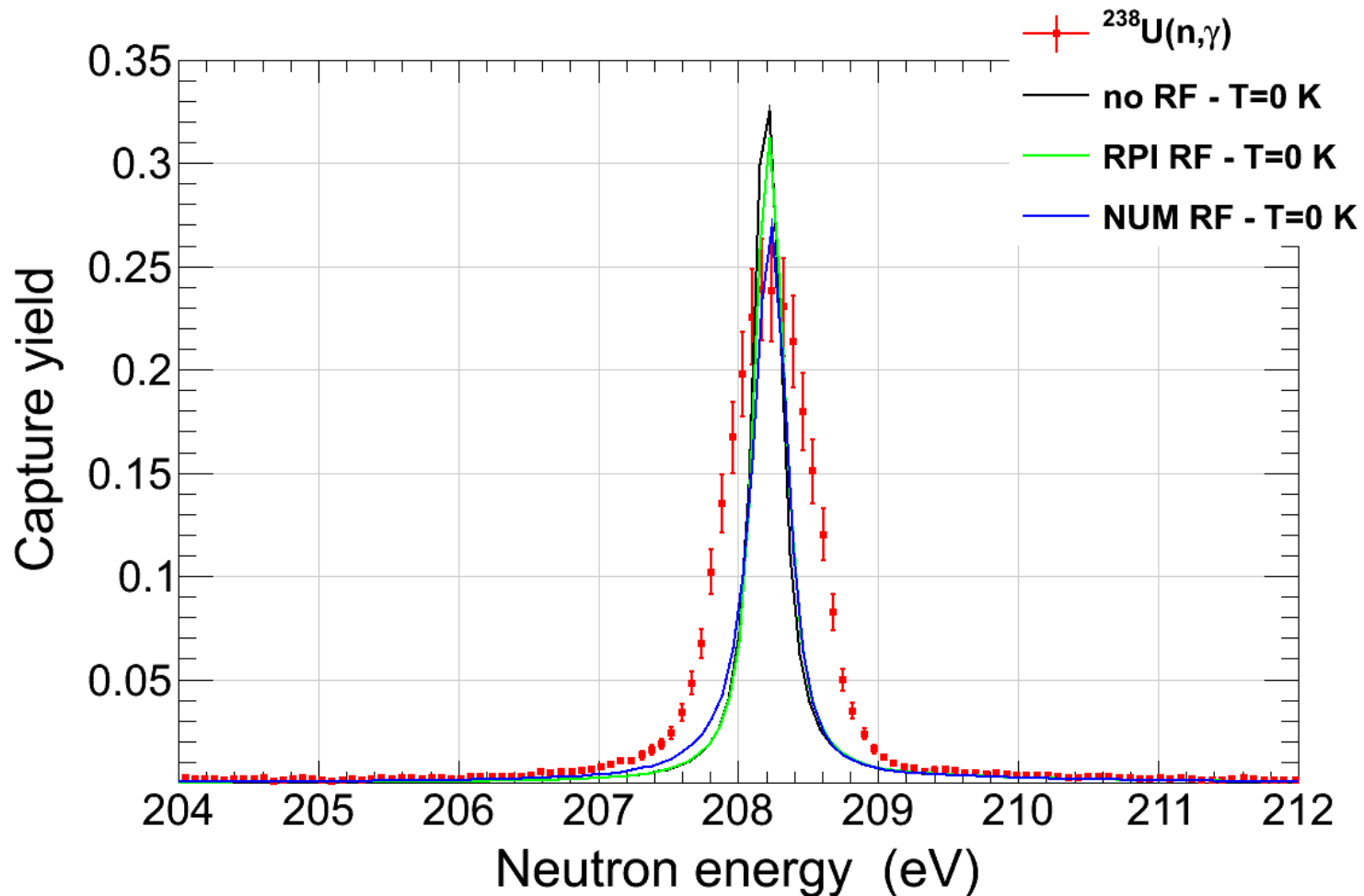
Phase-2 RESOLUTION FUNCTION



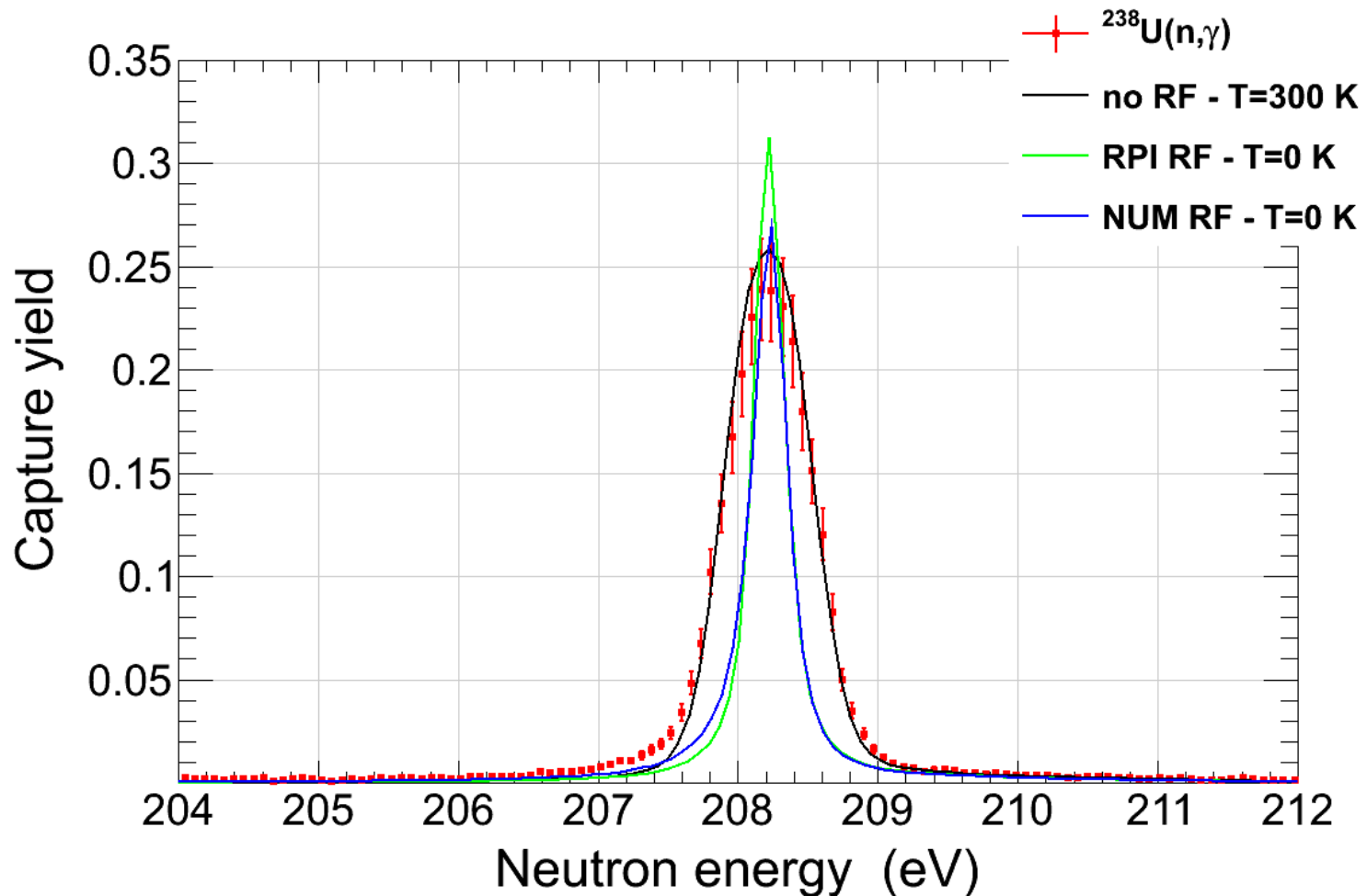
Phase-2 RESOLUTION FUNCTION



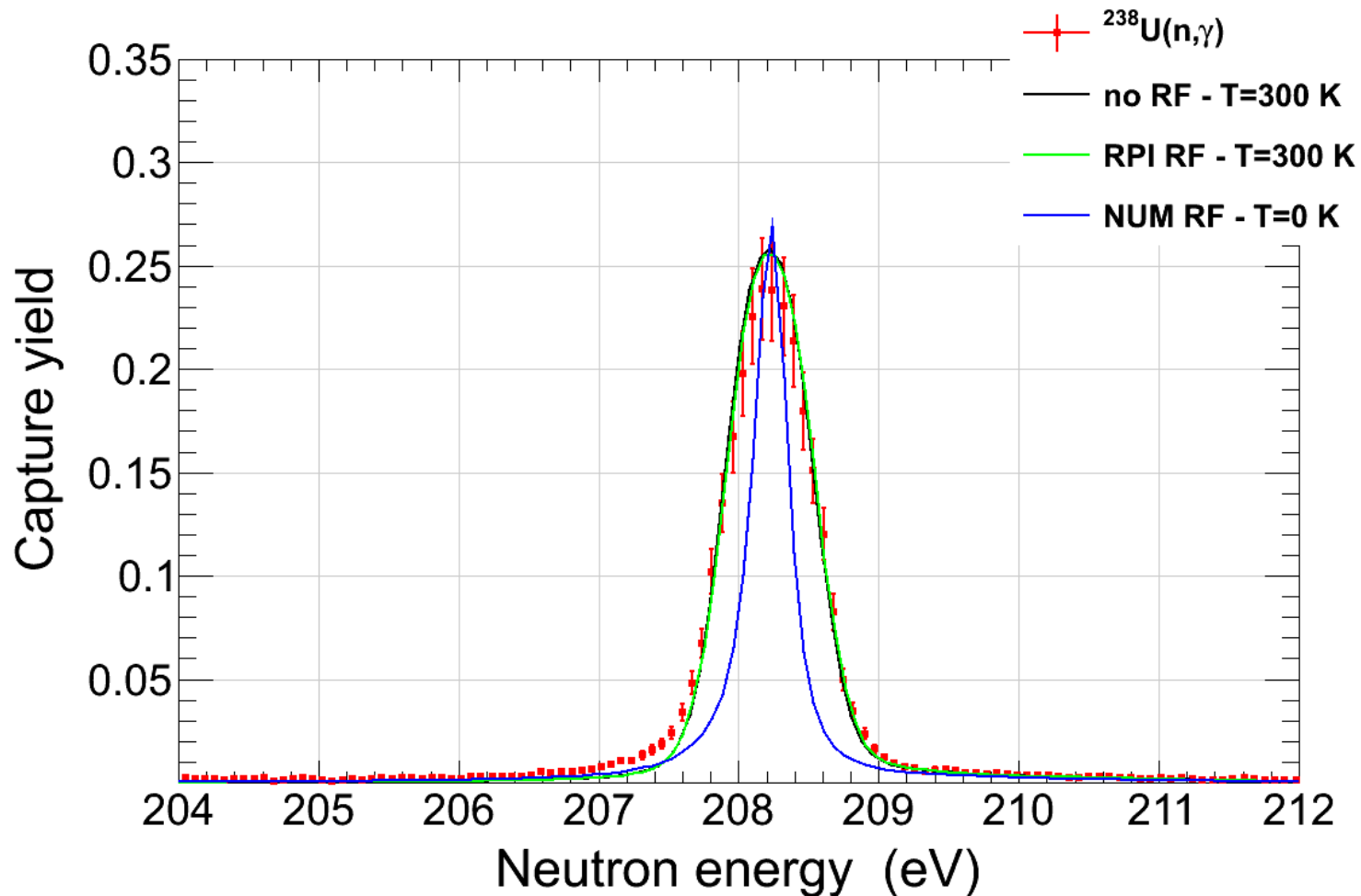
Phase-2 RESOLUTION FUNCTION



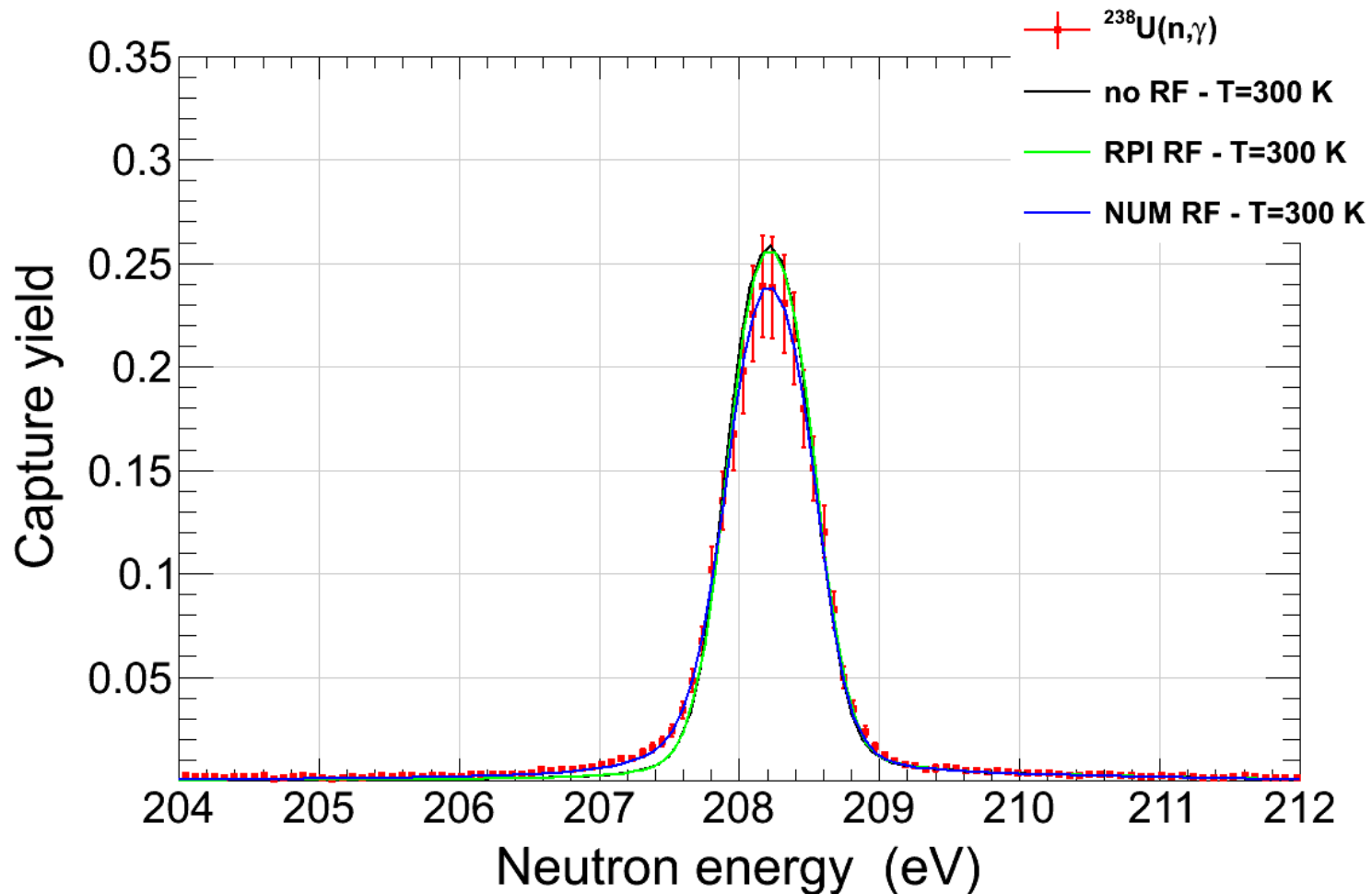
Phase-2 RESOLUTION FUNCTION



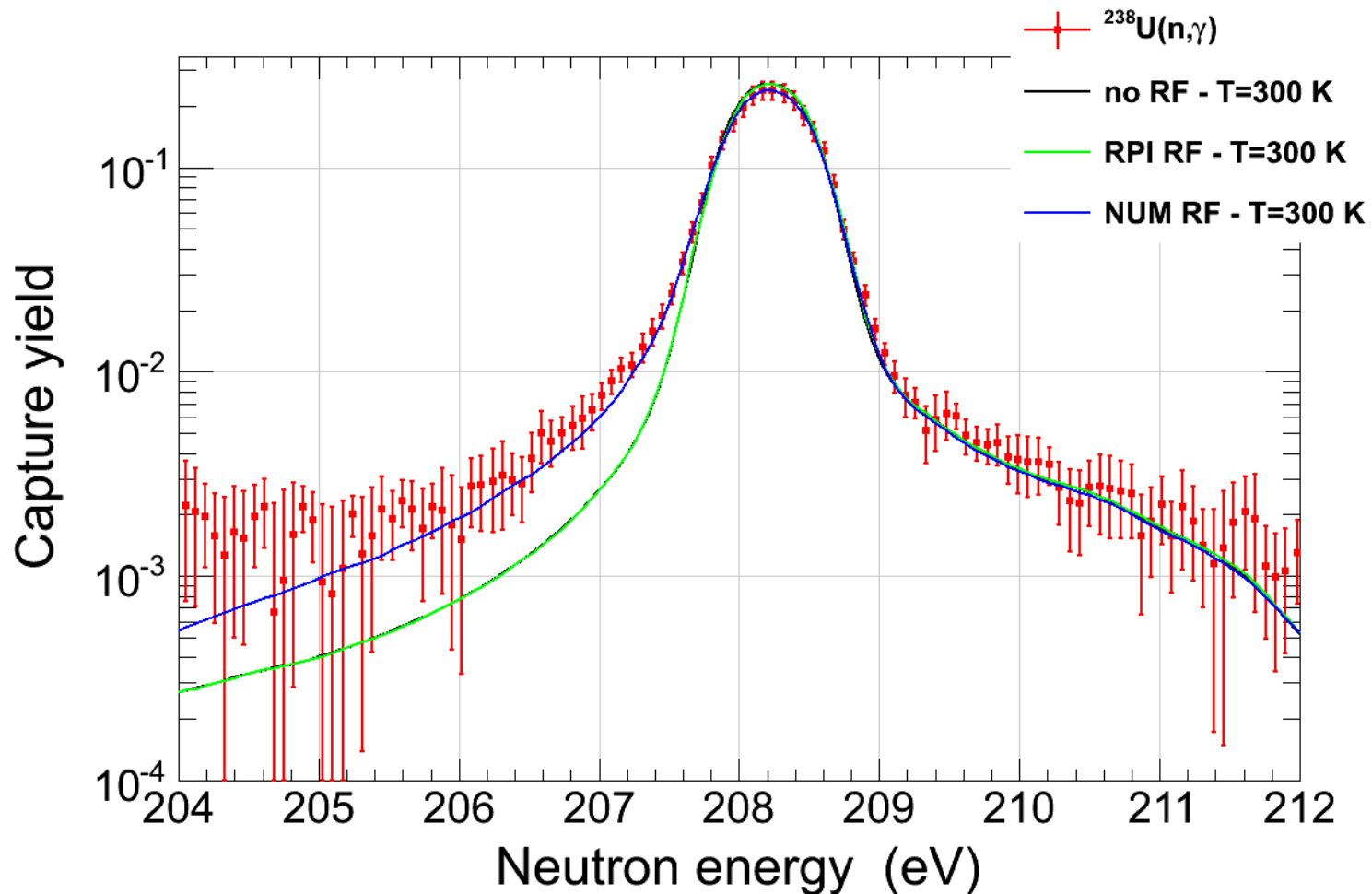
Phase-2 RESOLUTION FUNCTION



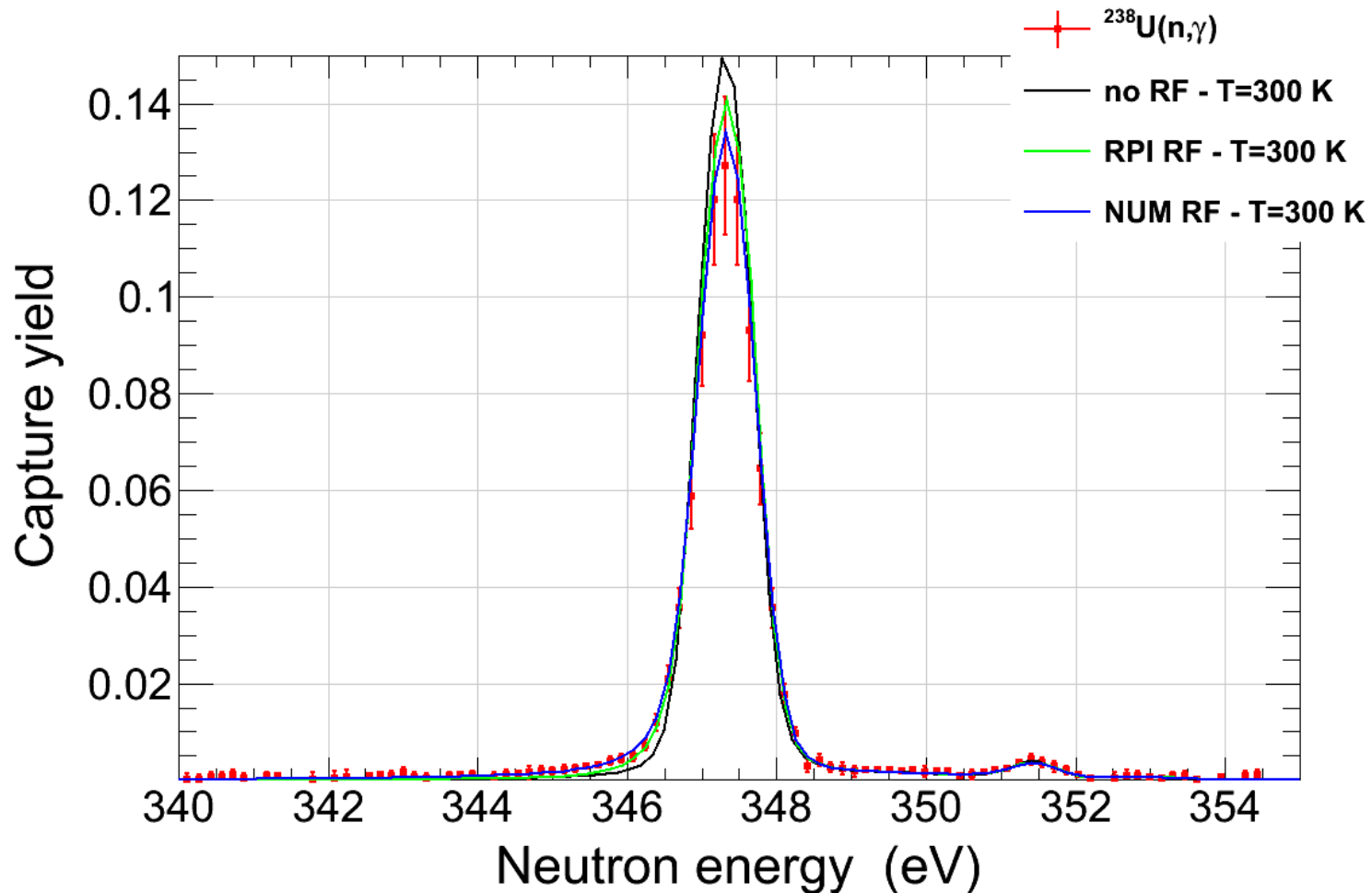
Phase-2 RESOLUTION FUNCTION



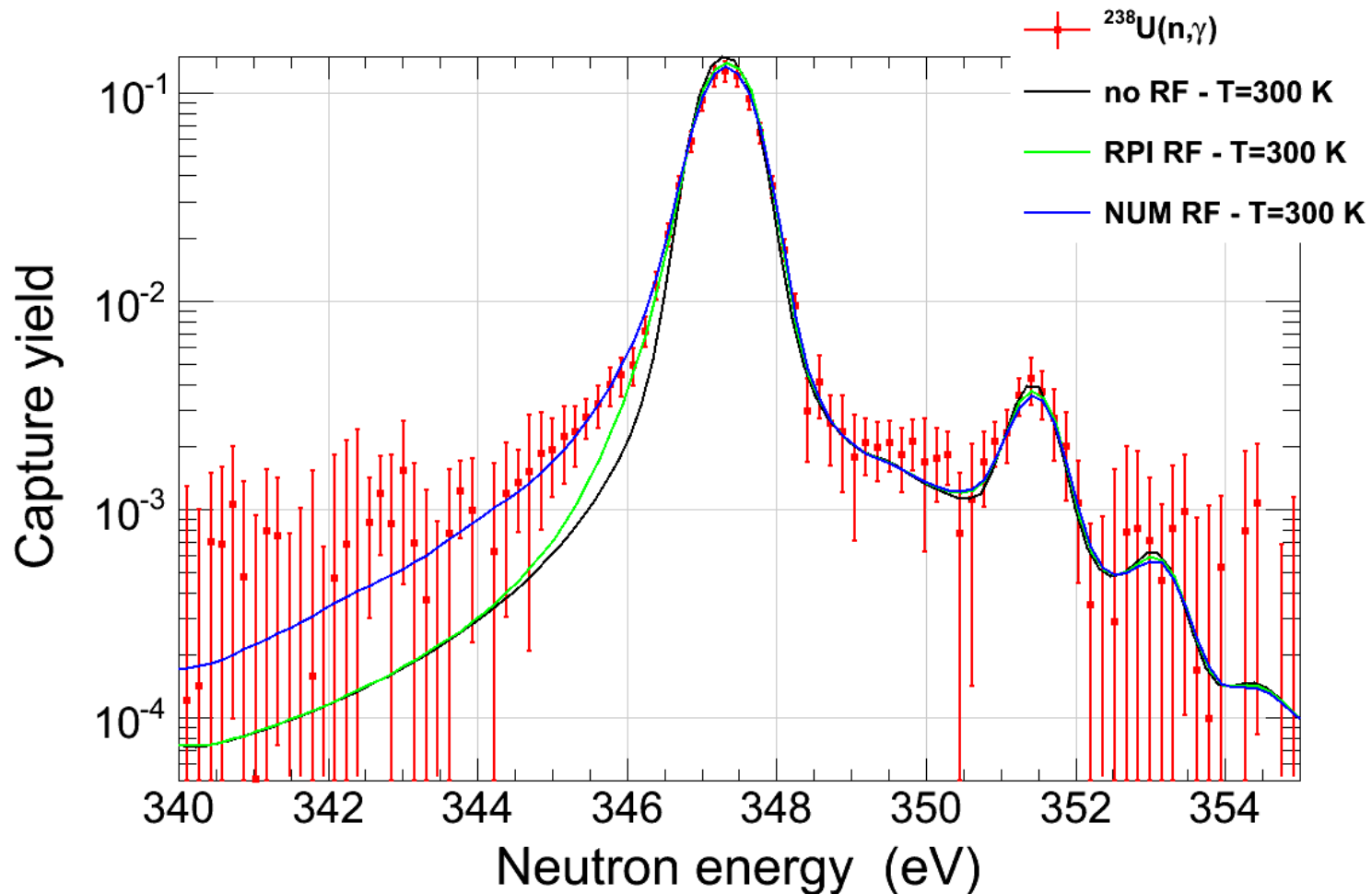
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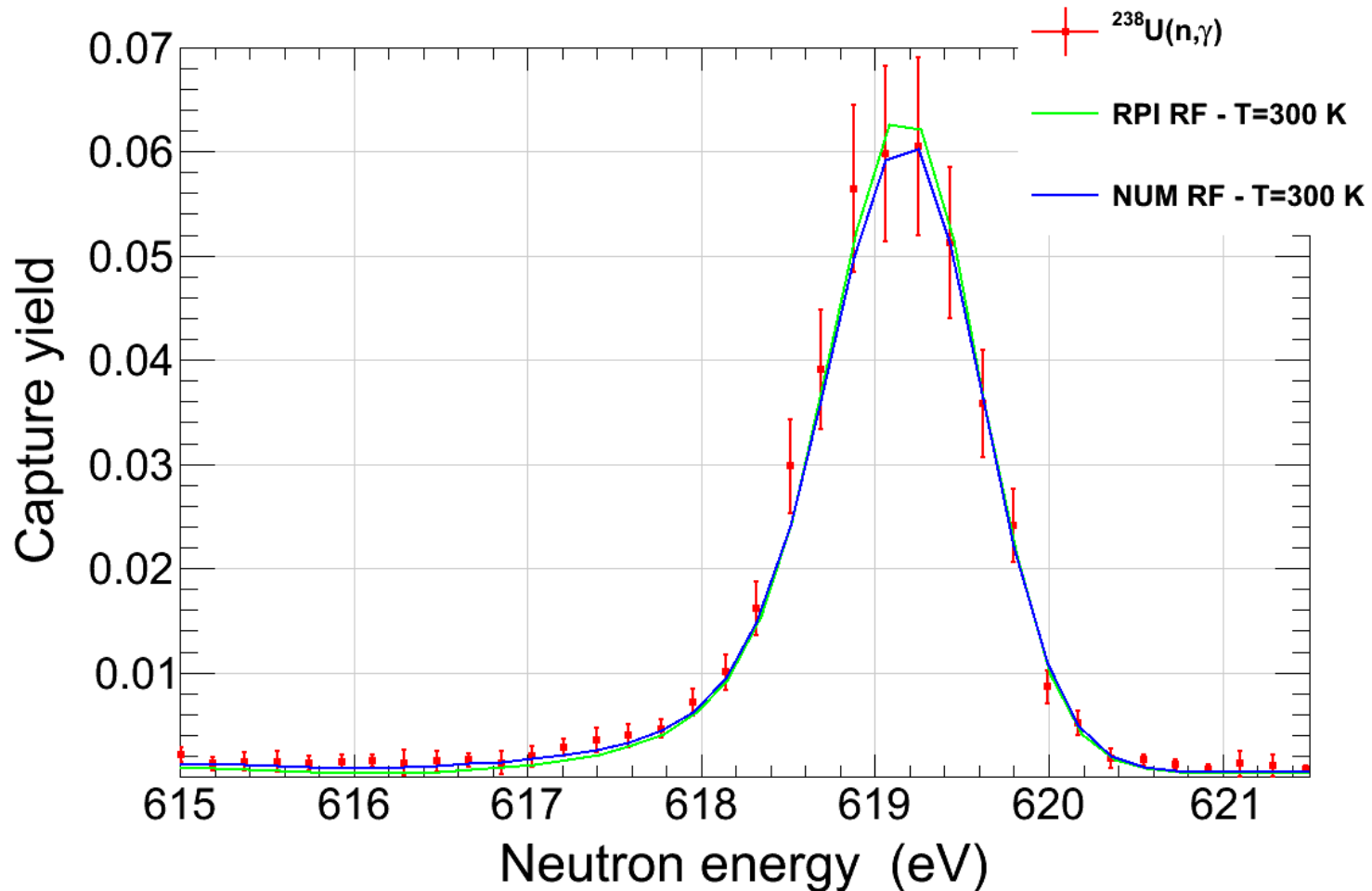
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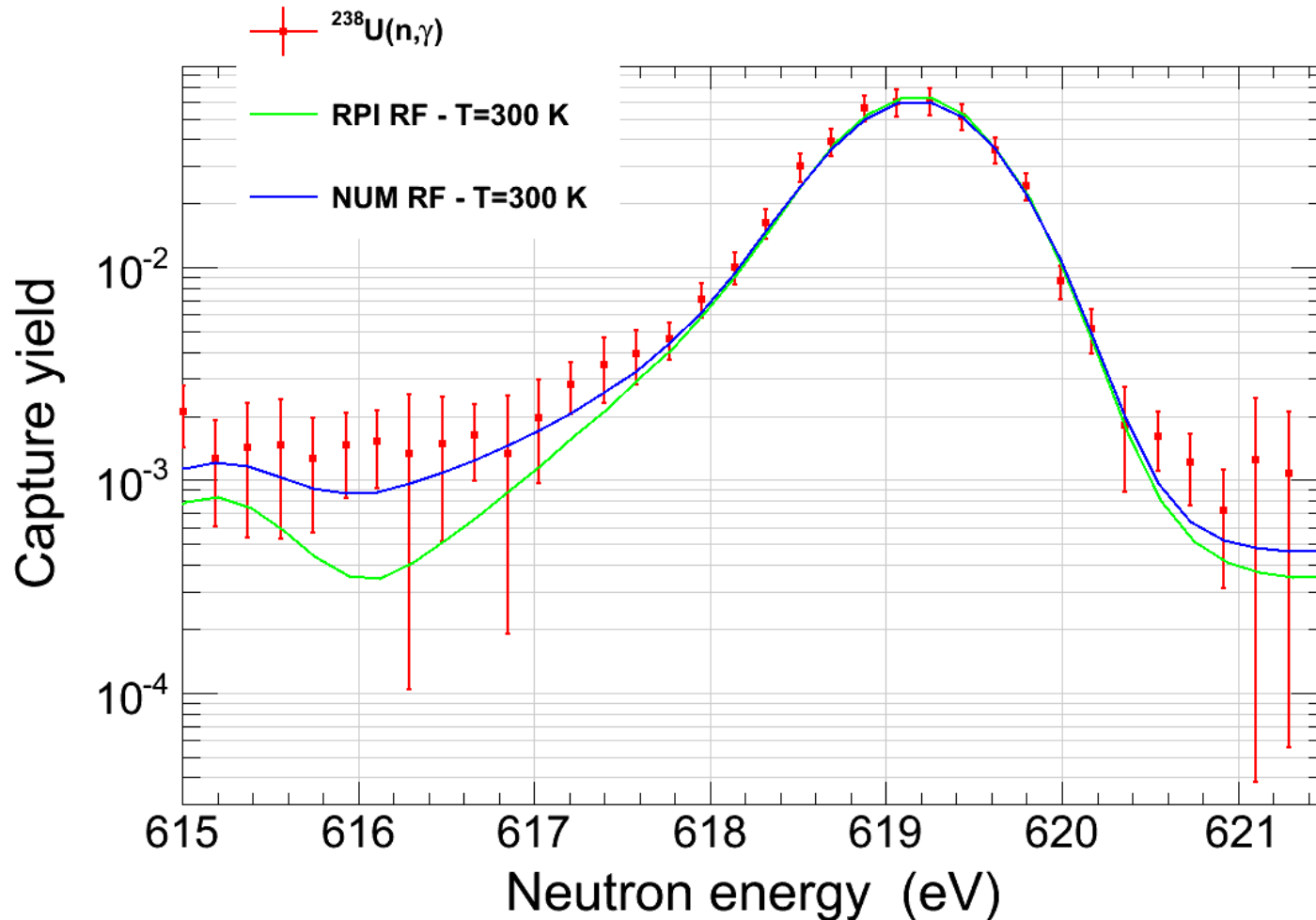
Phase-2 RESOLUTION FUNCTION



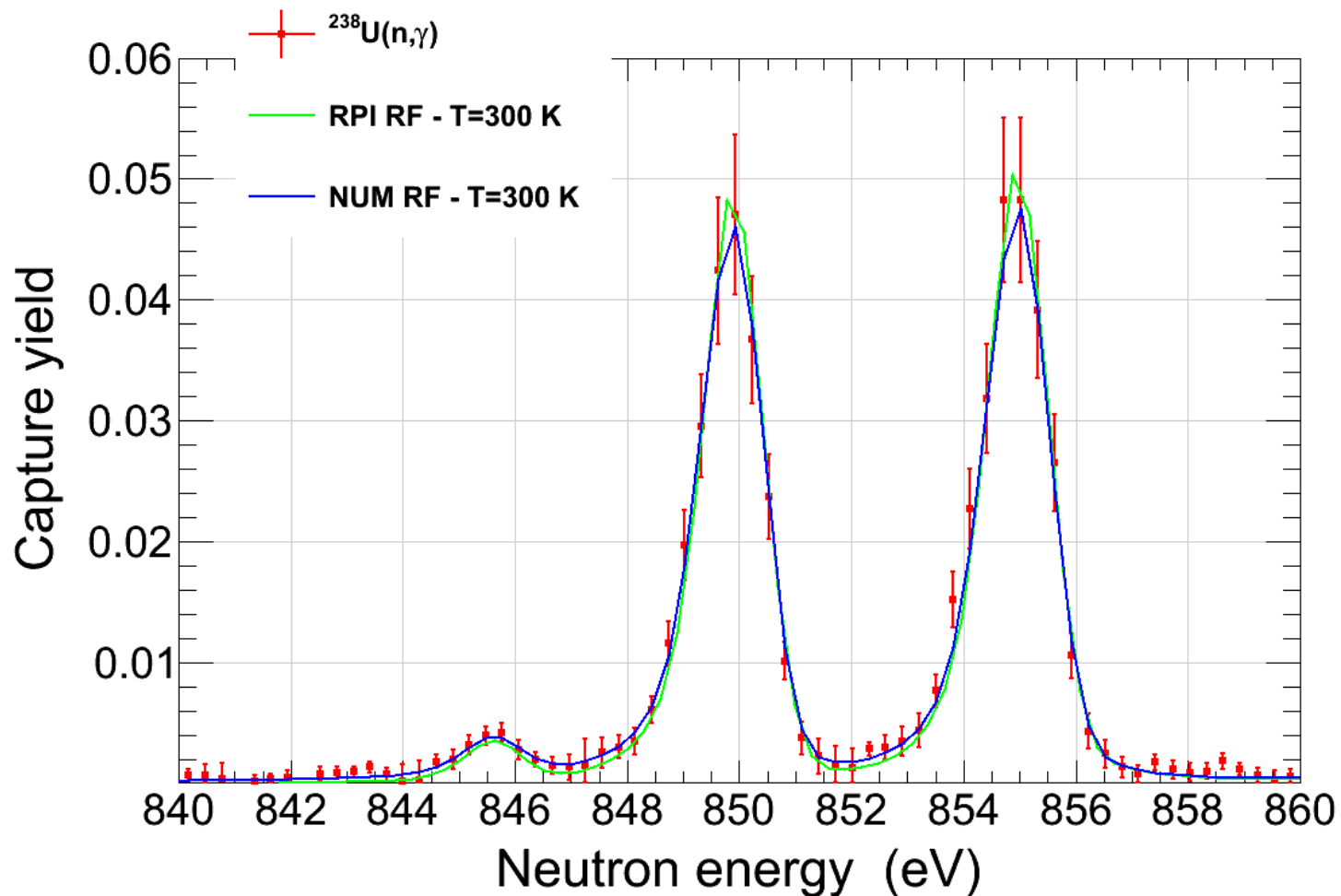
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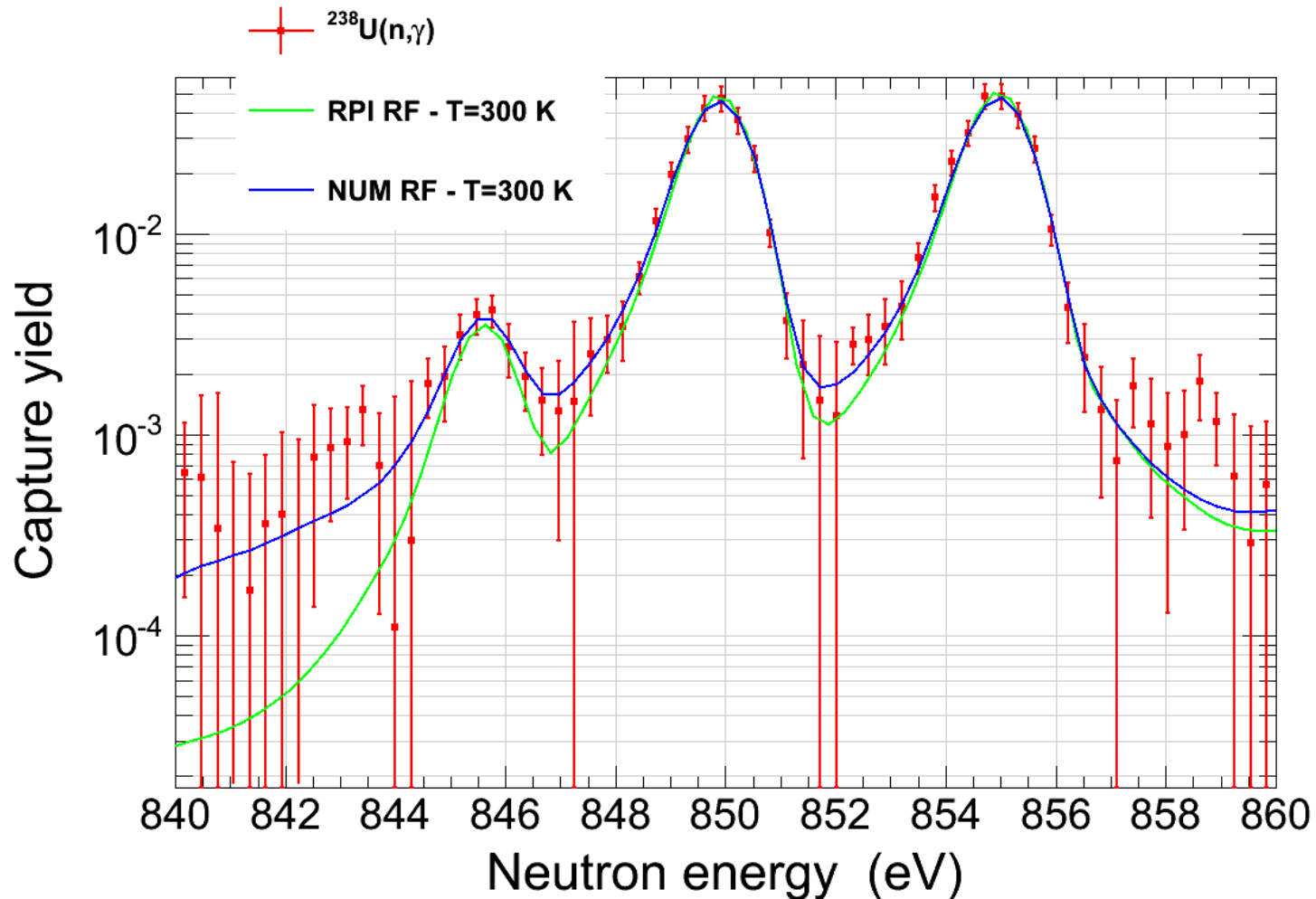
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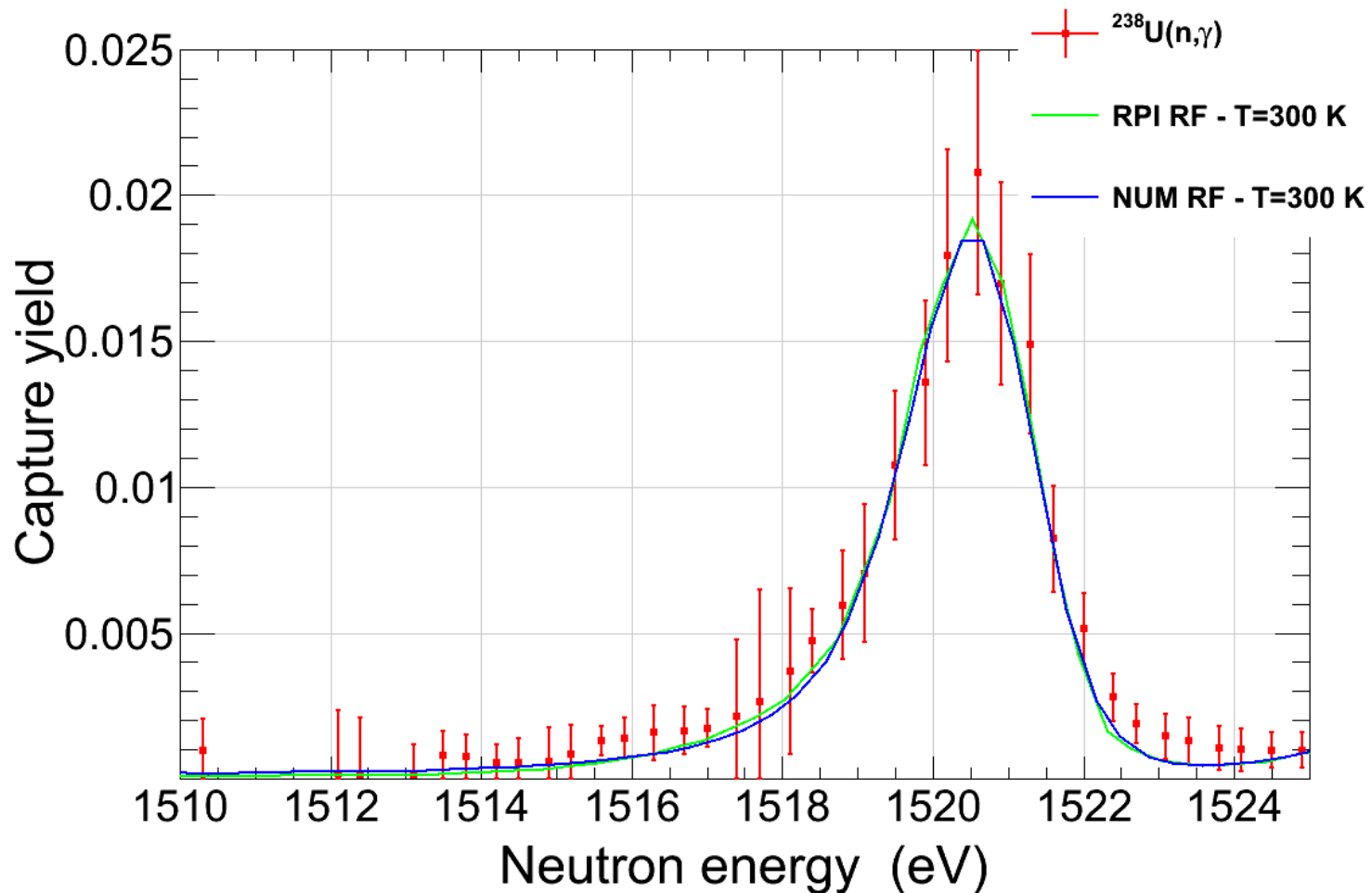
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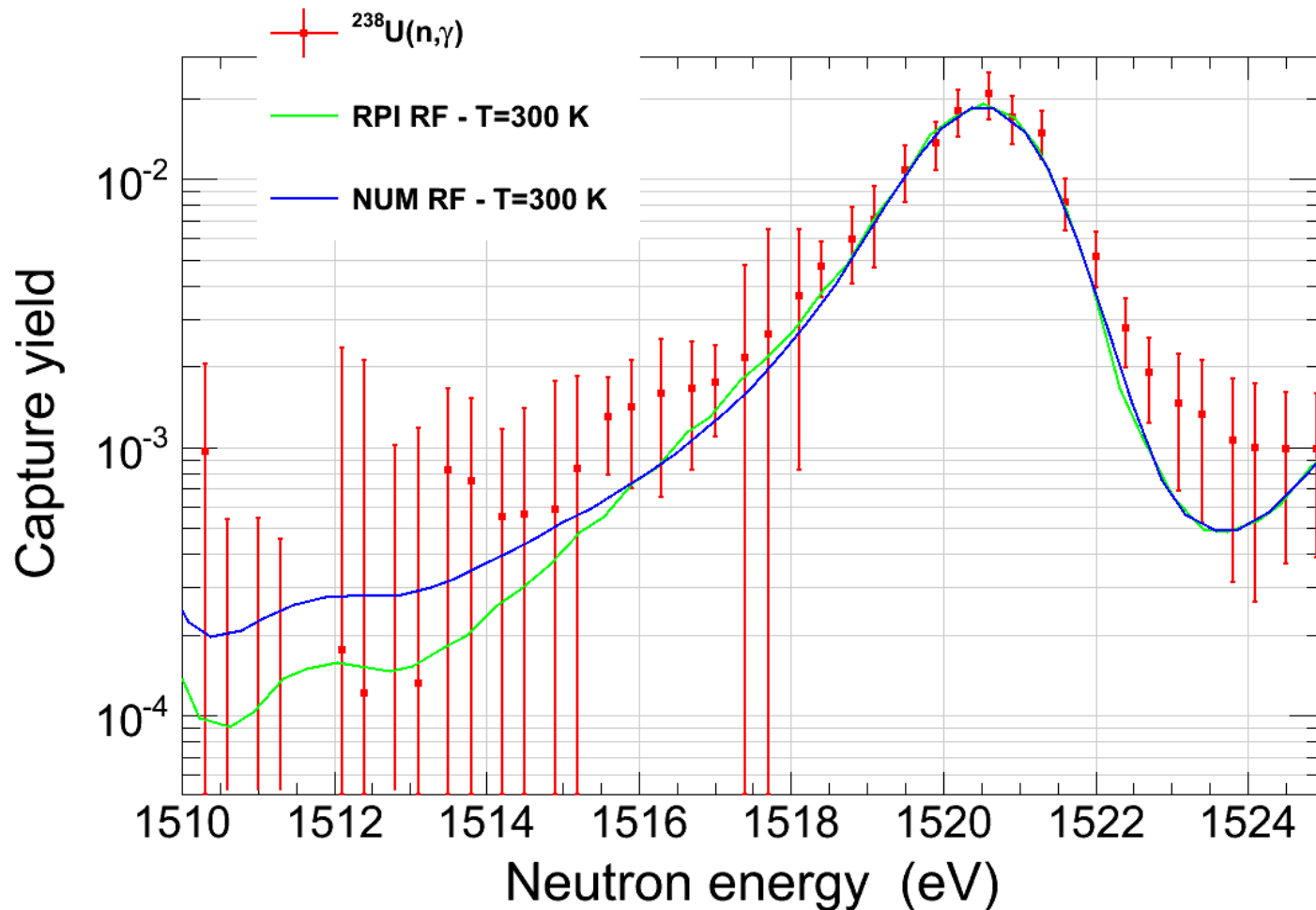
Phase-2 RESOLUTION FUNCTION



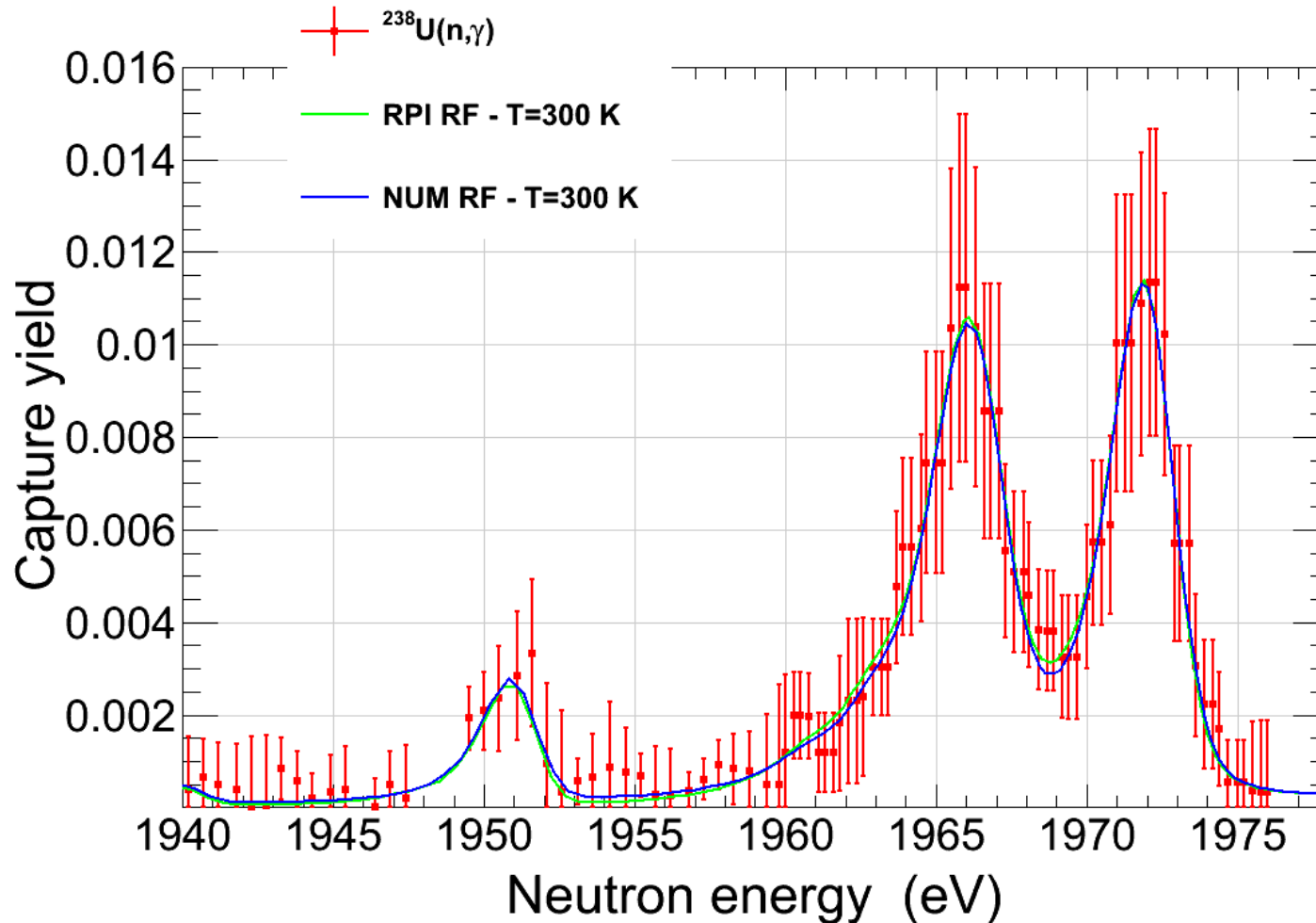
Phase-2 RESOLUTION FUNCTION



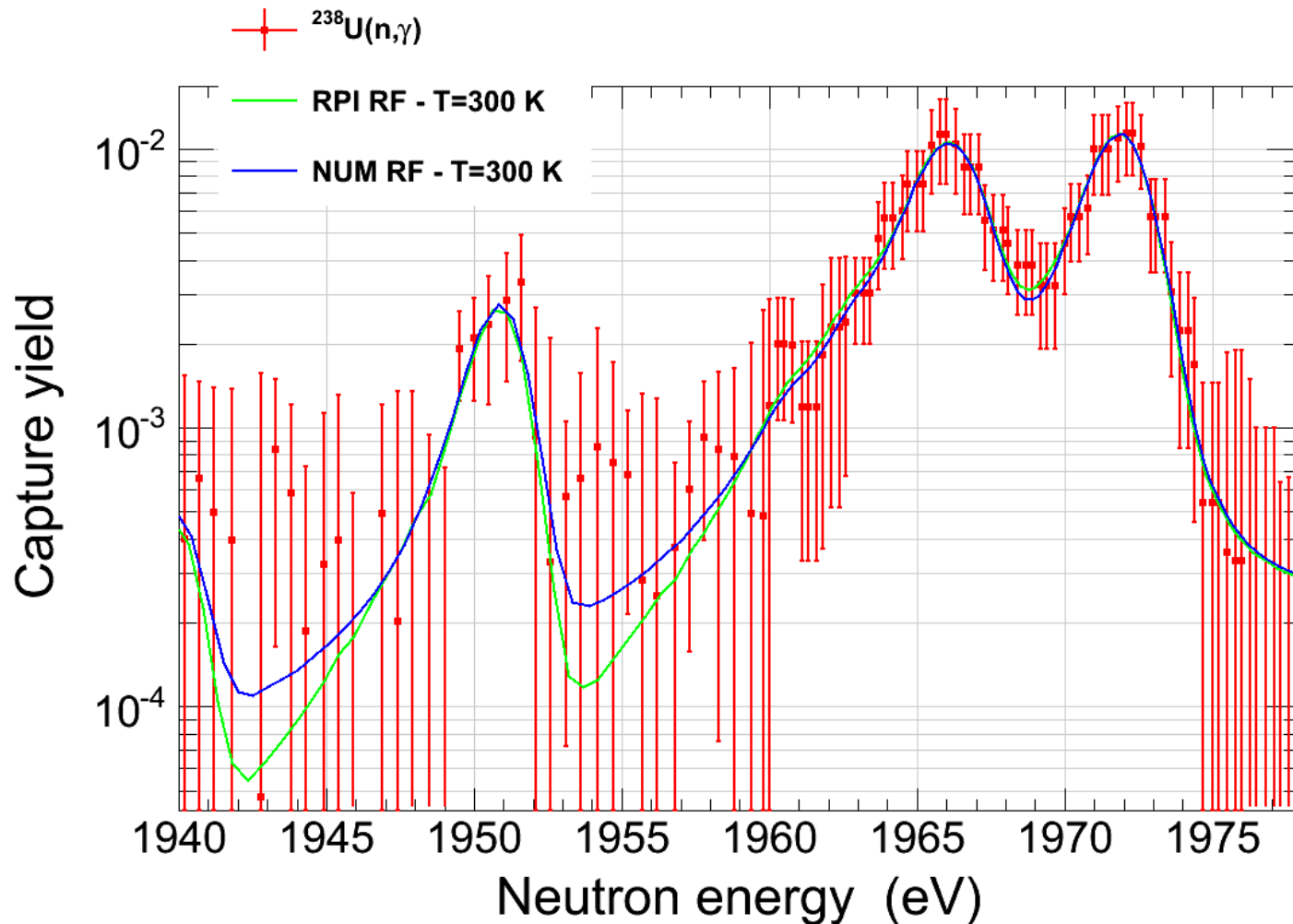
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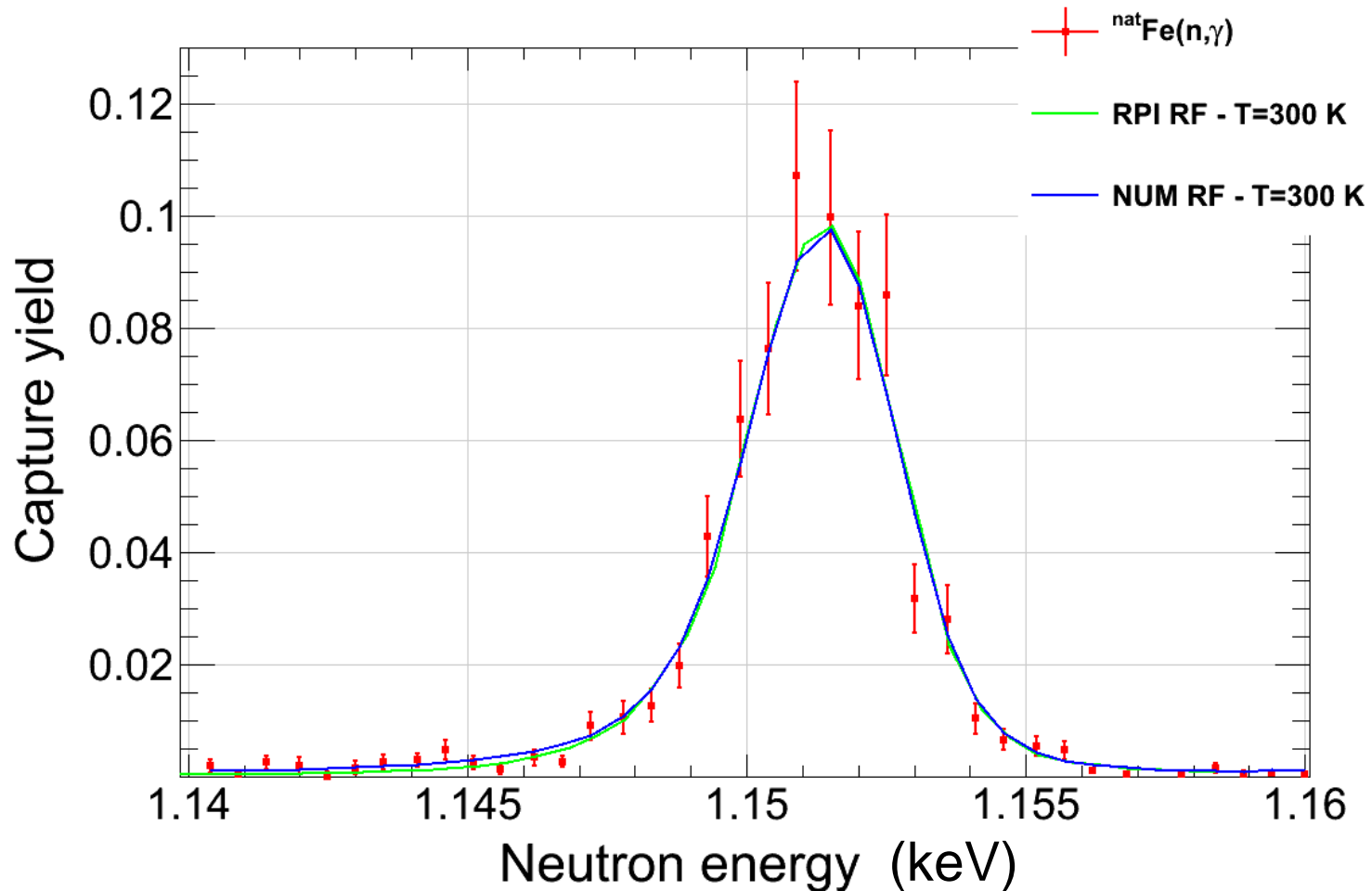
Phase-2 RESOLUTION FUNCTION



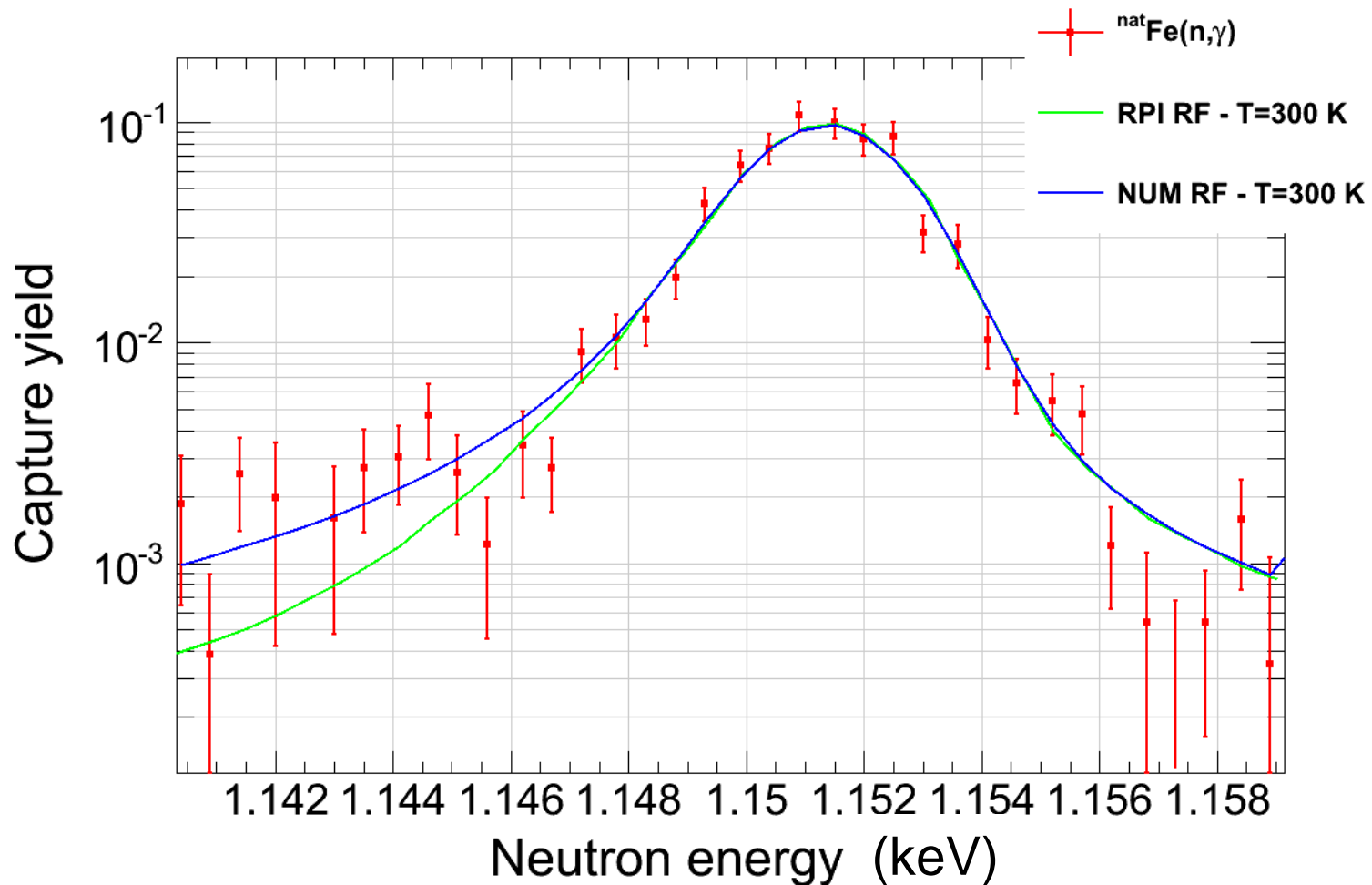
Phase-2 RESOLUTION FUNCTION



Phase-2 RESOLUTION FUNCTION

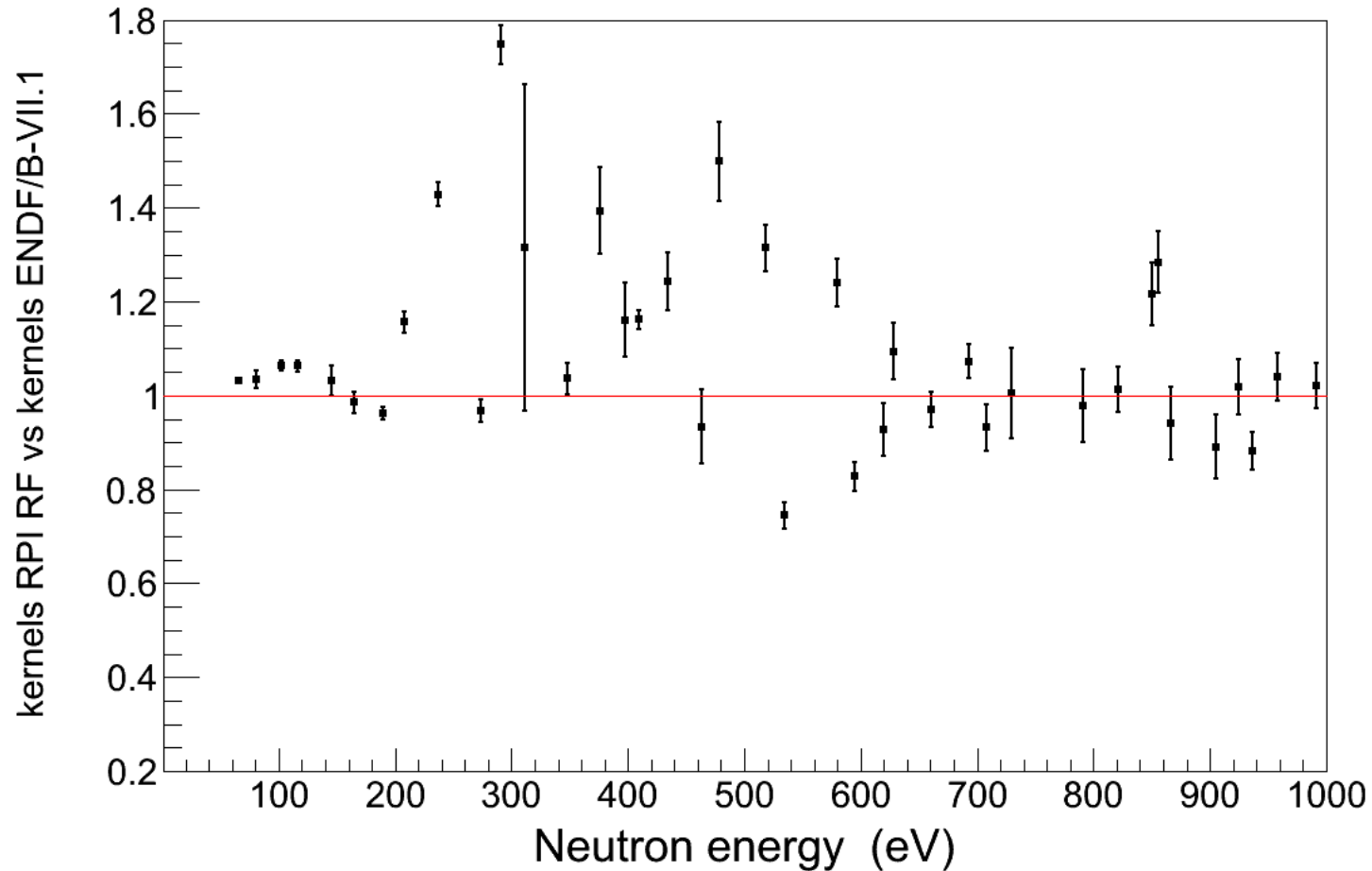


Phase-2 RESOLUTION FUNCTION



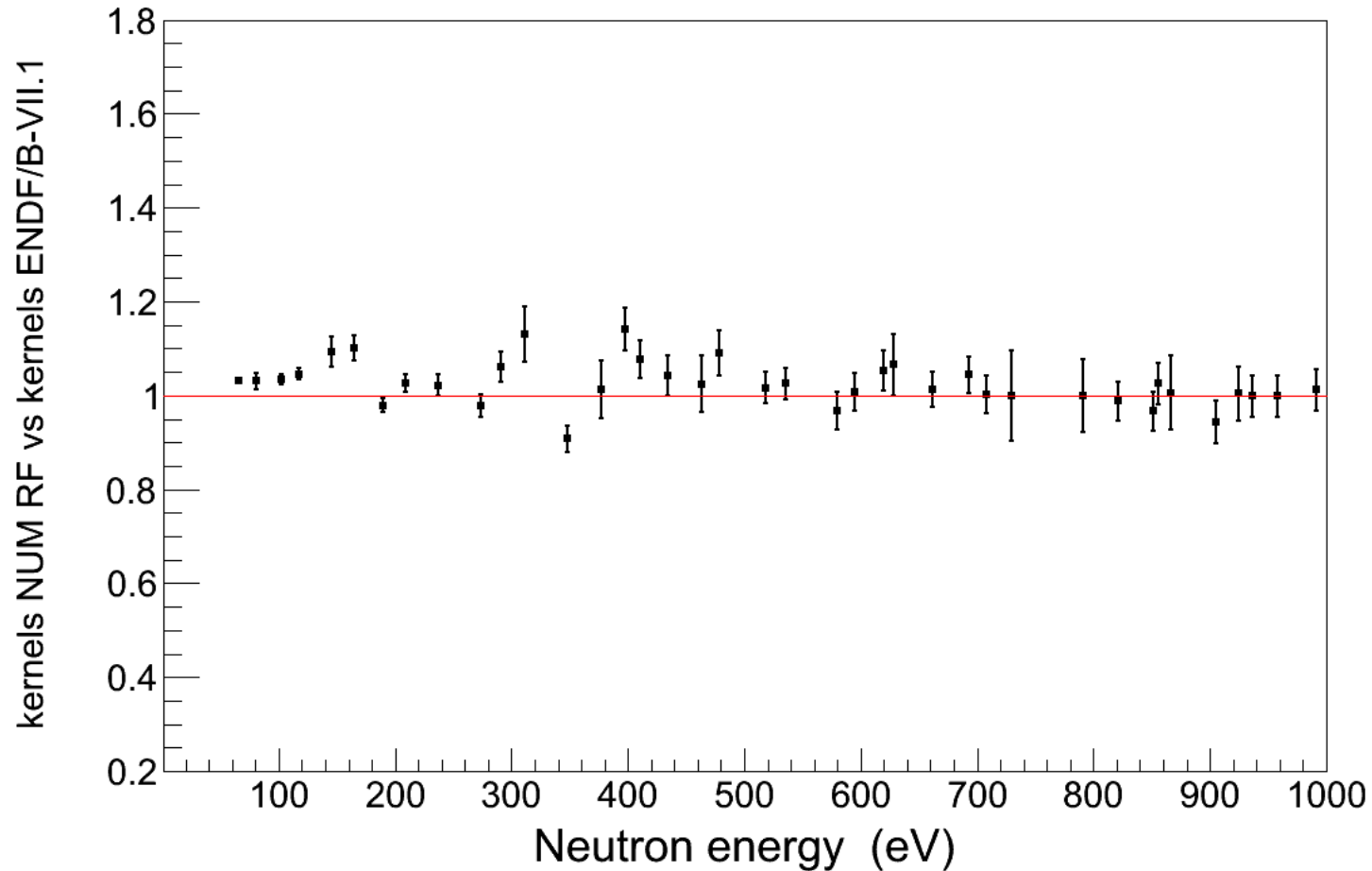
RESONANCE KERNELS: preliminary RSA

RPI resolution function



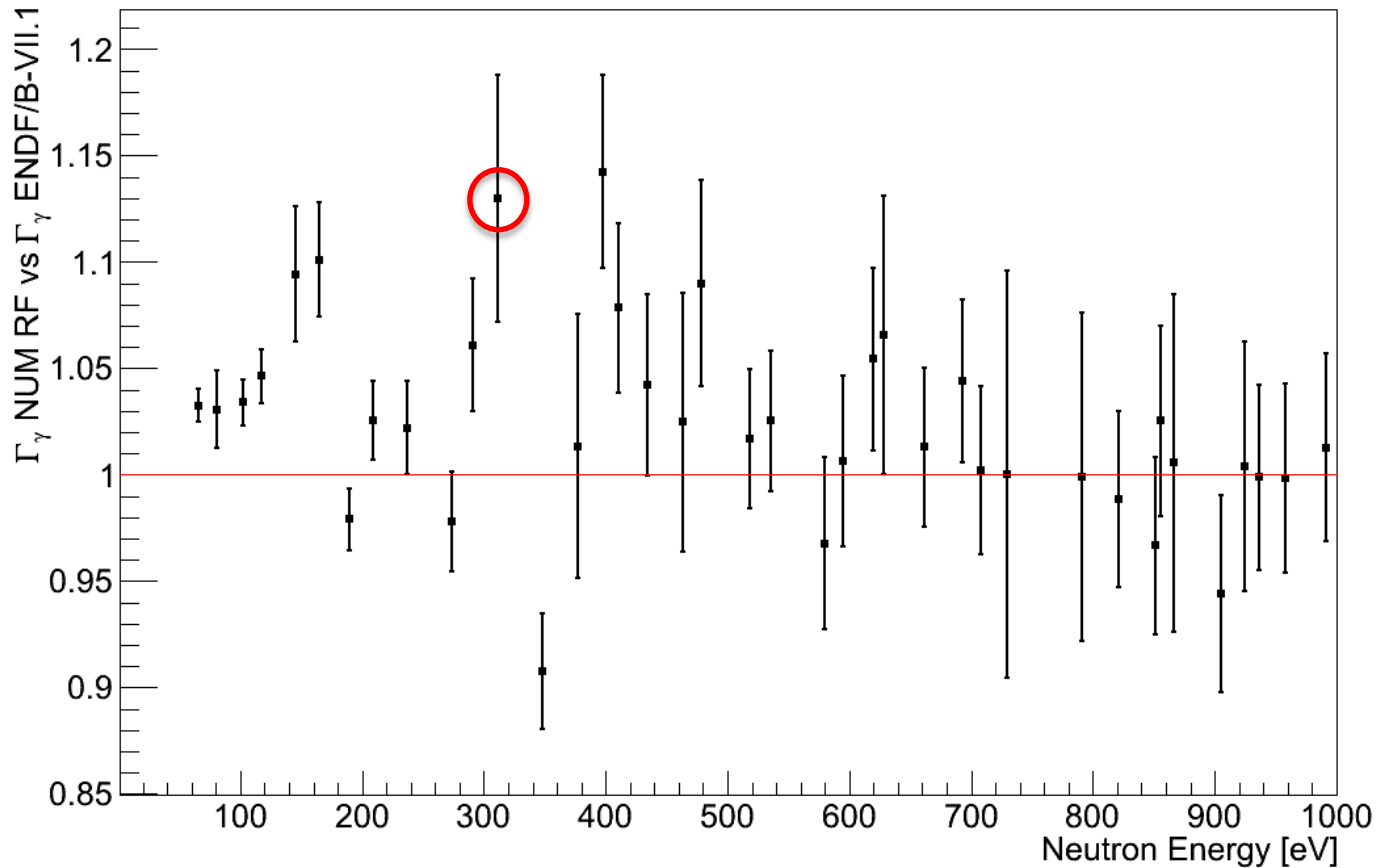
RESONANCE KERNELS: preliminary RSA

NUMERICAL resolution function

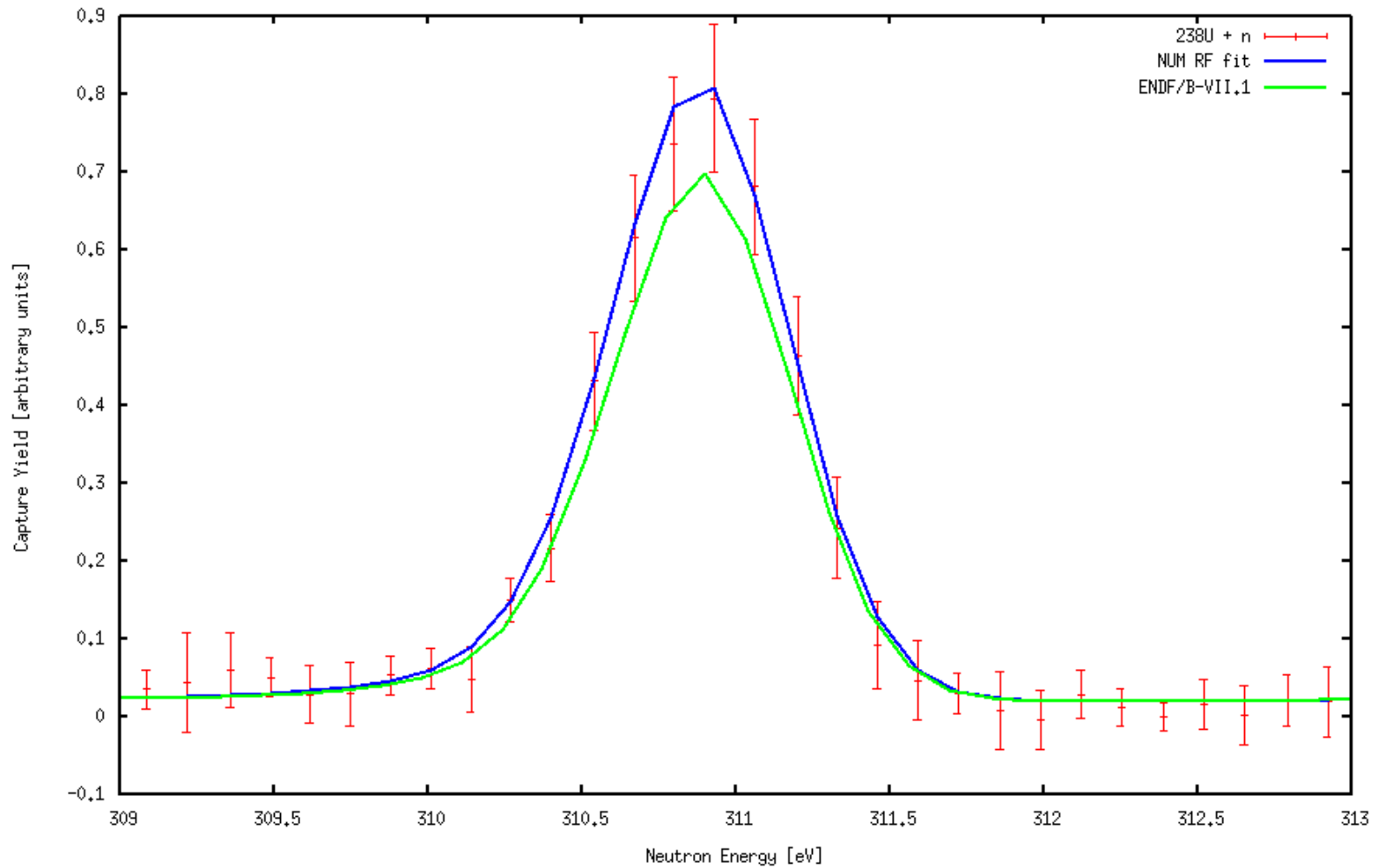


RESONANCE KERNELS: preliminary RSA

NUMERICAL resolution function

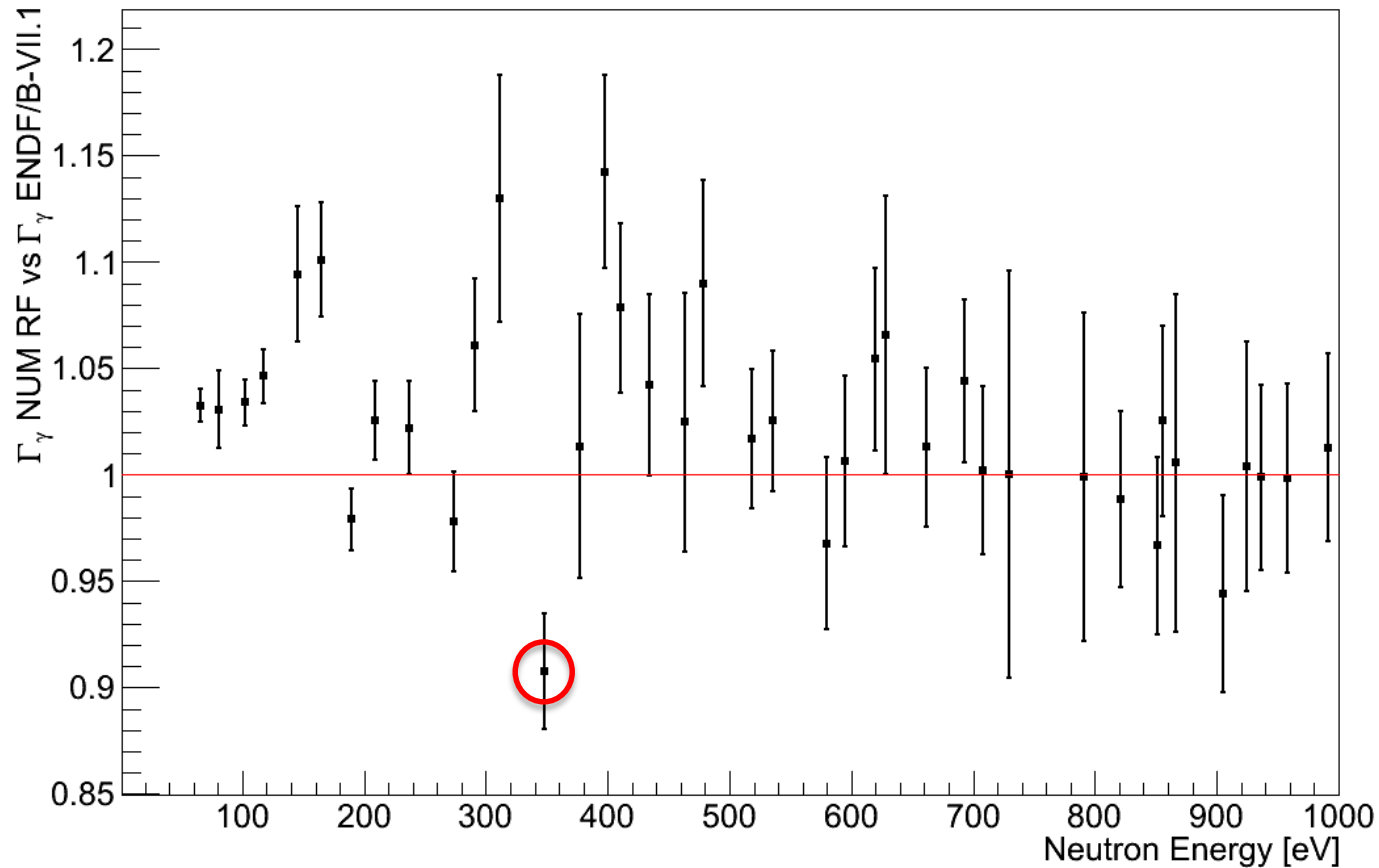


RESONANCE KERNELS: preliminary RSA

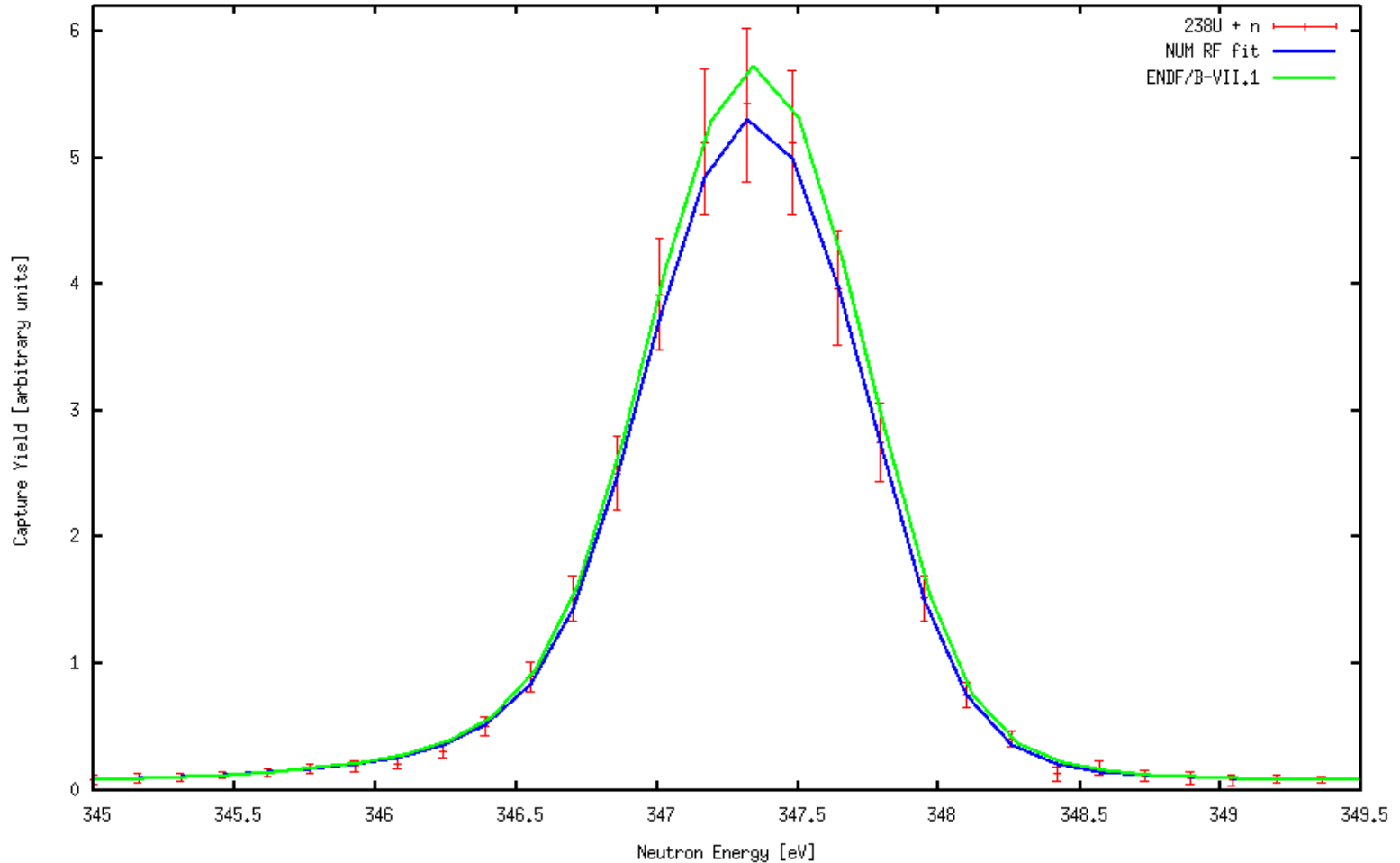


RESONANCE KERNELS: preliminary RSA

NUMERICAL resolution function

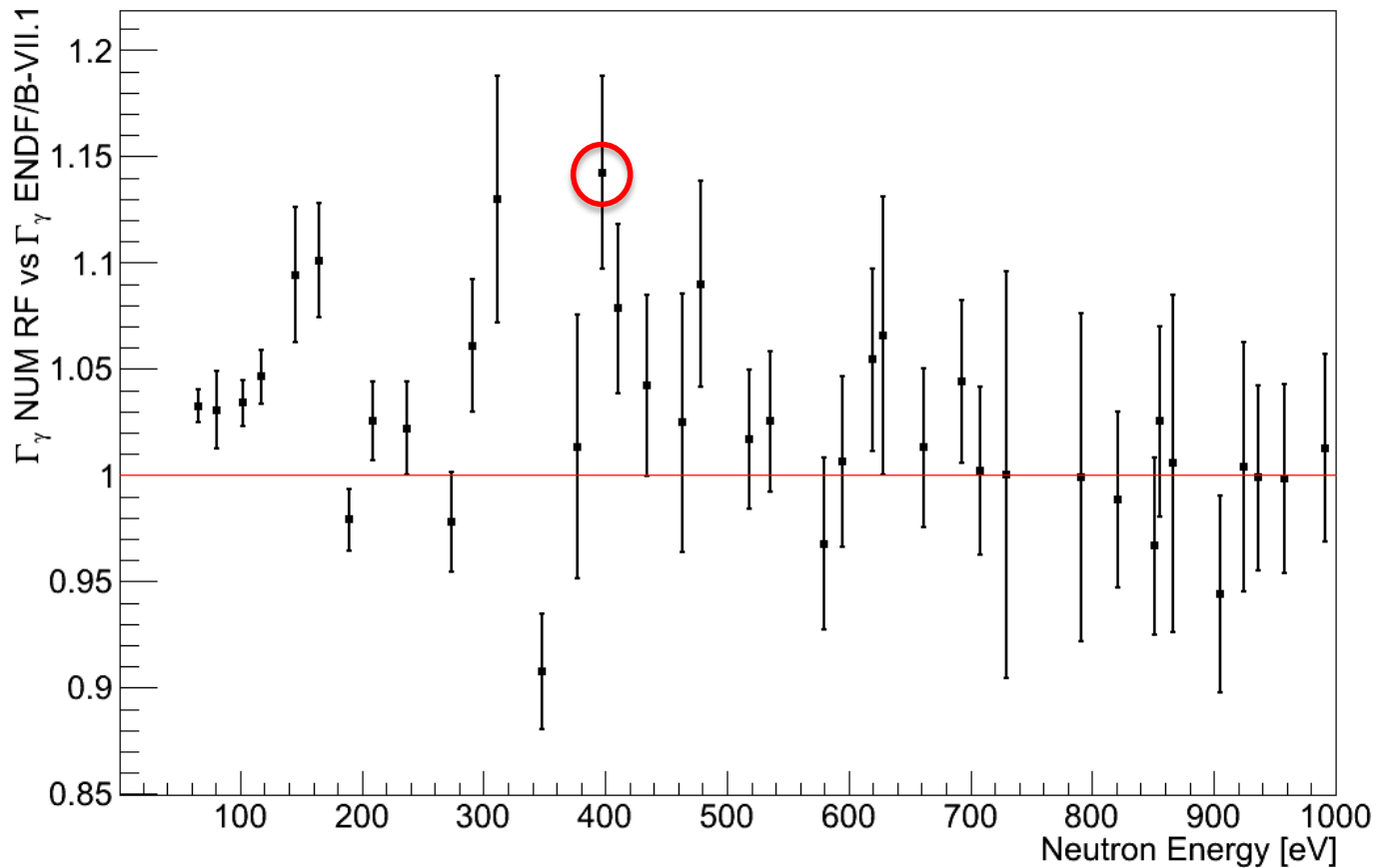


RESONANCE KERNELS: preliminary RSA

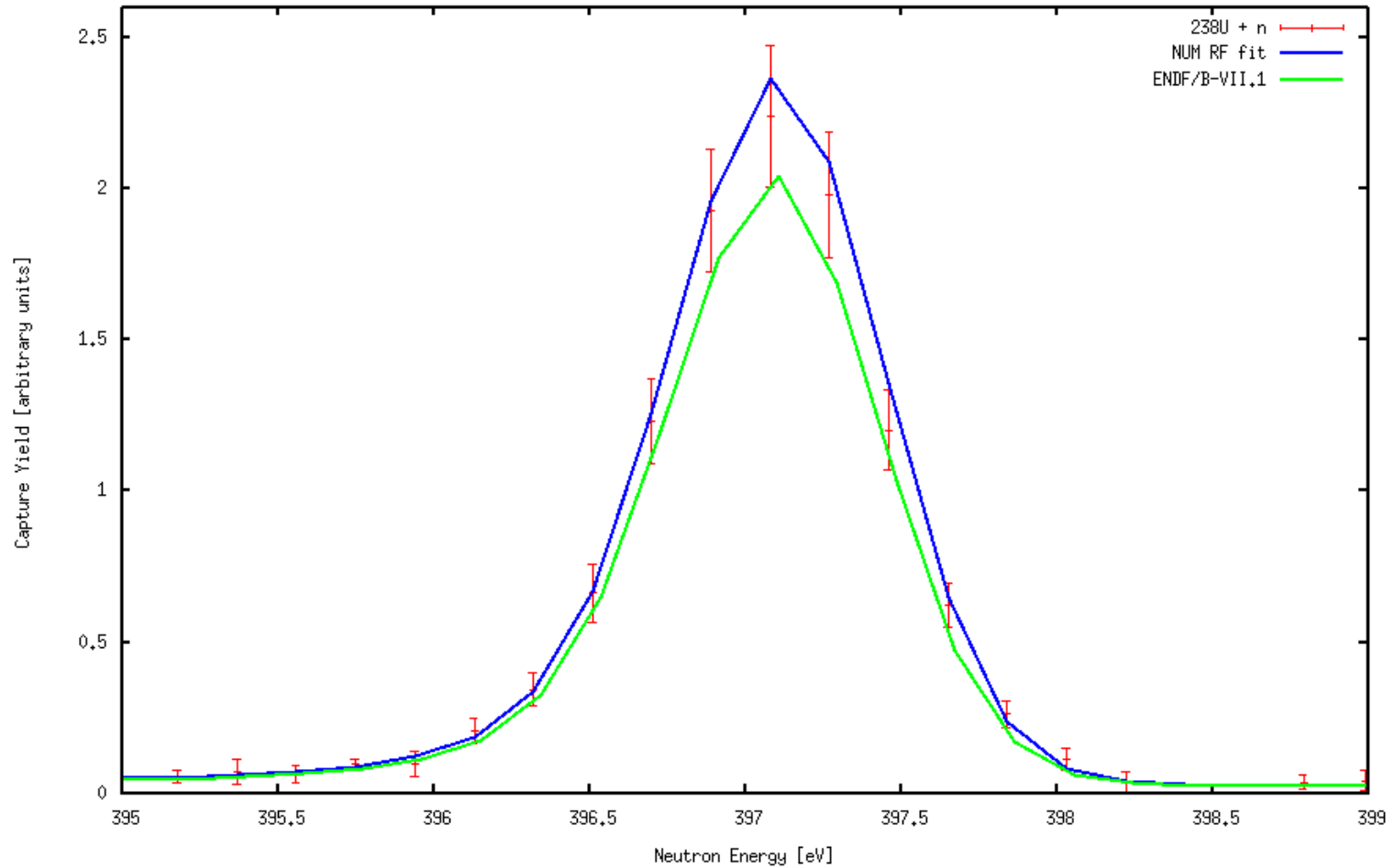


RESONANCE KERNELS: preliminary RSA

NUMERICAL resolution function

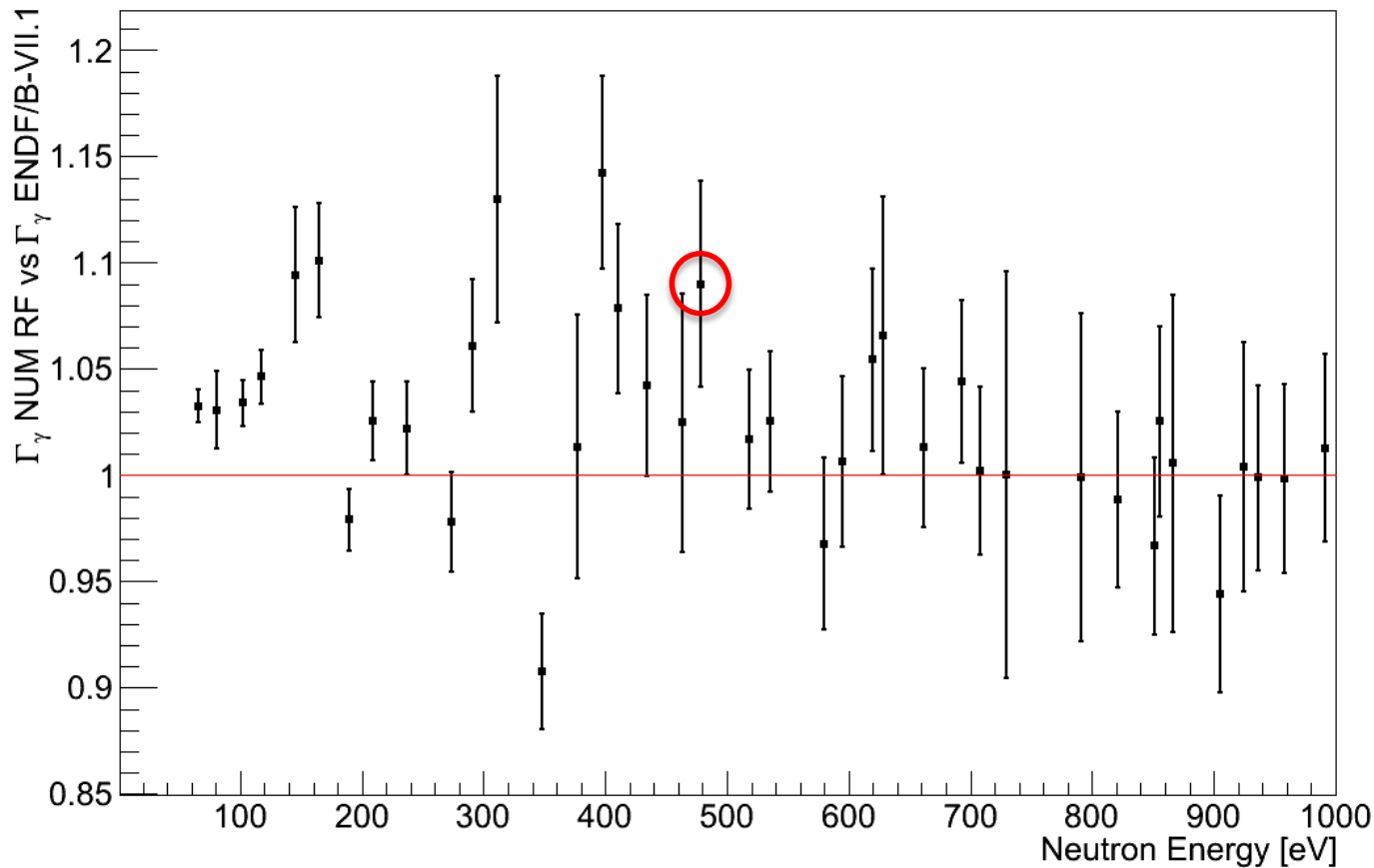


RESONANCE KERNELS: preliminary RSA

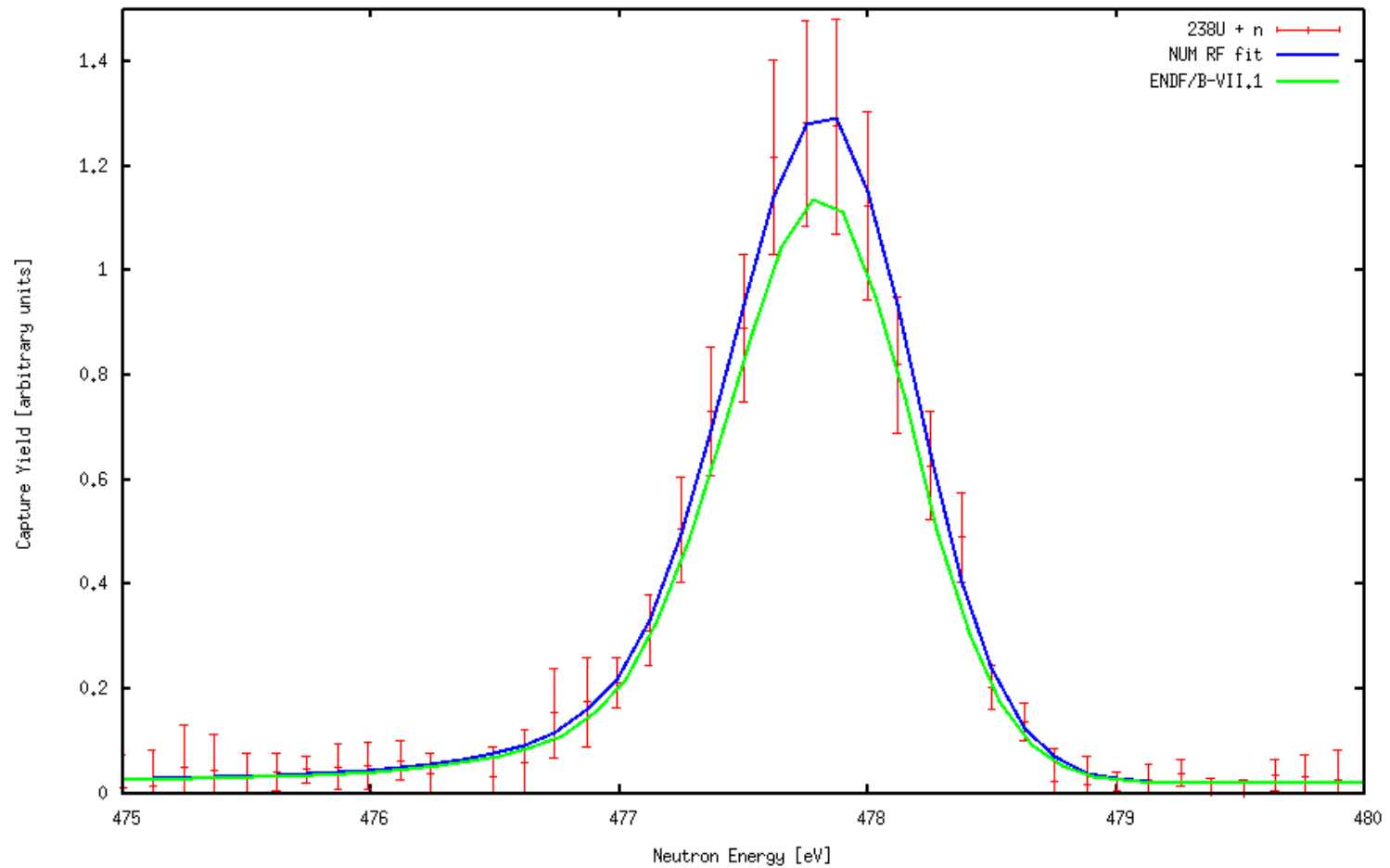


RESONANCE KERNELS: preliminary RSA

NUMERICAL resolution function

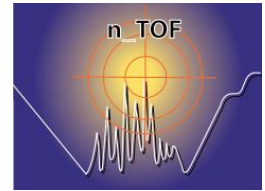


RESONANCE KERNELS: preliminary RSA



CONCLUSIONS

- Accurate data reduction and calibrations
- Accurate background subtraction
- Analysis of the background level with filters ongoing
→ URR analysis
- Study of the Resolution Function: **NUMERICAL RF**
(propagated to EAR-1) **IS WORKING FOR PHASE2**
- Preliminary RSA (up to 1 keV): Resonance Kernels
deviates from ENDF/B-VII.1 in average of about 2%



Thank you!

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