

# $^{19}\text{F}(\gamma, \alpha)^{15}\text{N}$ Rates

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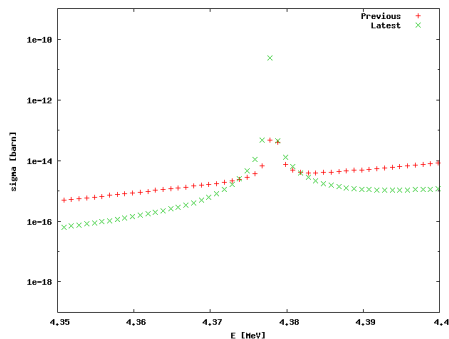
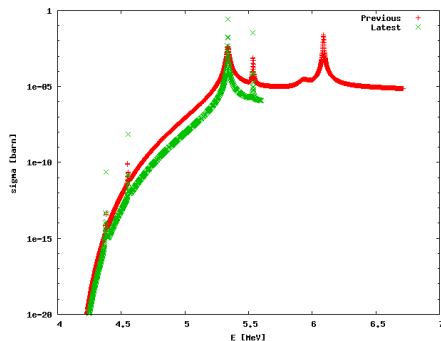


December 14, 2017

- Continued to check code - found small error in uncertainties given last meeting
- Implemented consistent numbers (my assumed density was higher)
- Reconciled previous code and numerical methods
  - Adaptive integral method gives more accurate results
  - Overall smaller by 10%
- Added in resolution (0.16%) and random background
  - Resolution on few-10 keV level not a big effect

# Differences

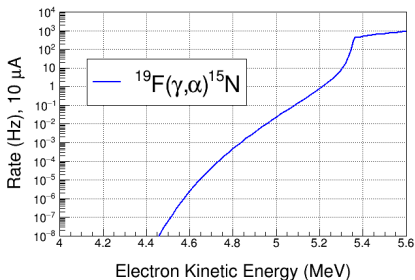
- Was using significantly different cross sections
- Resonances in same place but curve is generally below



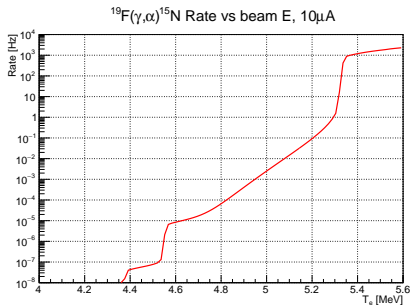
# Differences

- Using same densities,  $\sigma$  on wiki
- Rates in scanning region smaller by order of magnitude
- Resonances are larger

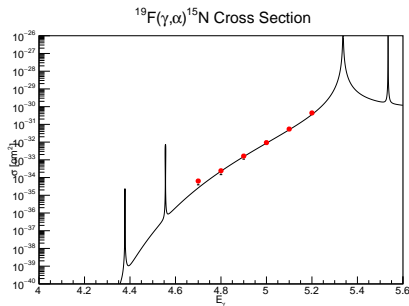
Updated Previous



Mine



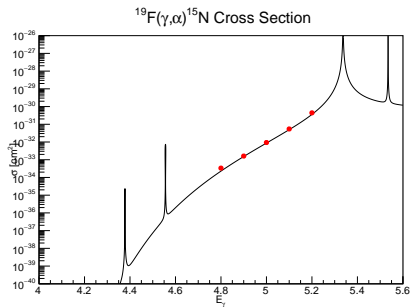
# Run Plan to 4.75 MeV



$T$	$E_\gamma$	$I$ ( $\mu\text{A}$ )	$t$ (h)	Yield	Back	Recon. $d\sigma/\sigma$ (%)
4.75	4.70	50.0	98	54	395	39.5
4.85	4.80	22.6	45	59	179	39.8
4.95	4.90	7.4	15	40	59	33.1
5.05	5.00	3.2	6	44	25	26.5
5.15	5.10	1.3	3	45	11	22.8
5.25	5.20	0.5	1	43	4	19.9

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# Run Plan to 4.85 MeV



						Recon
$T$	$E_\gamma$	$I$ ( $\mu\text{A}$ )	$t$ (h)	Yield	Back	$d\sigma/\sigma$ (%)
4.85	4.80	50.0	96	277	382	9.3
4.95	4.90	24.4	47	419	187	8.2
5.05	5.00	8.6	16	310	66	8.5
5.15	5.10	3.6	7	322	28	8.0
5.25	5.20	1.3	2.5	309	10	7.3

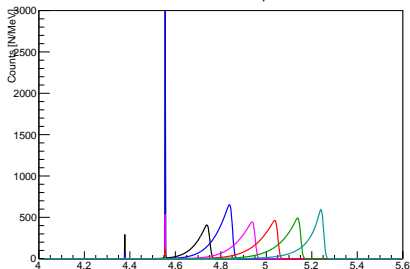
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# Resolution Effects

- Gross distortions can occur at the high side for large enough resolution

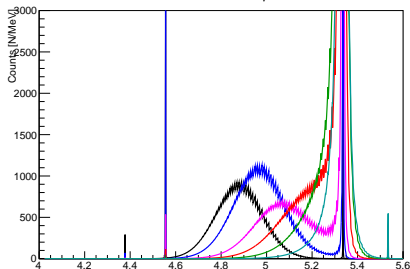
$$\sigma_E = 0.16\%$$

Counts vs  $E_\gamma$



$$\sigma_E = 100 \text{ keV}$$

Counts vs  $E_\gamma$



BACKUP



