

PTFE check

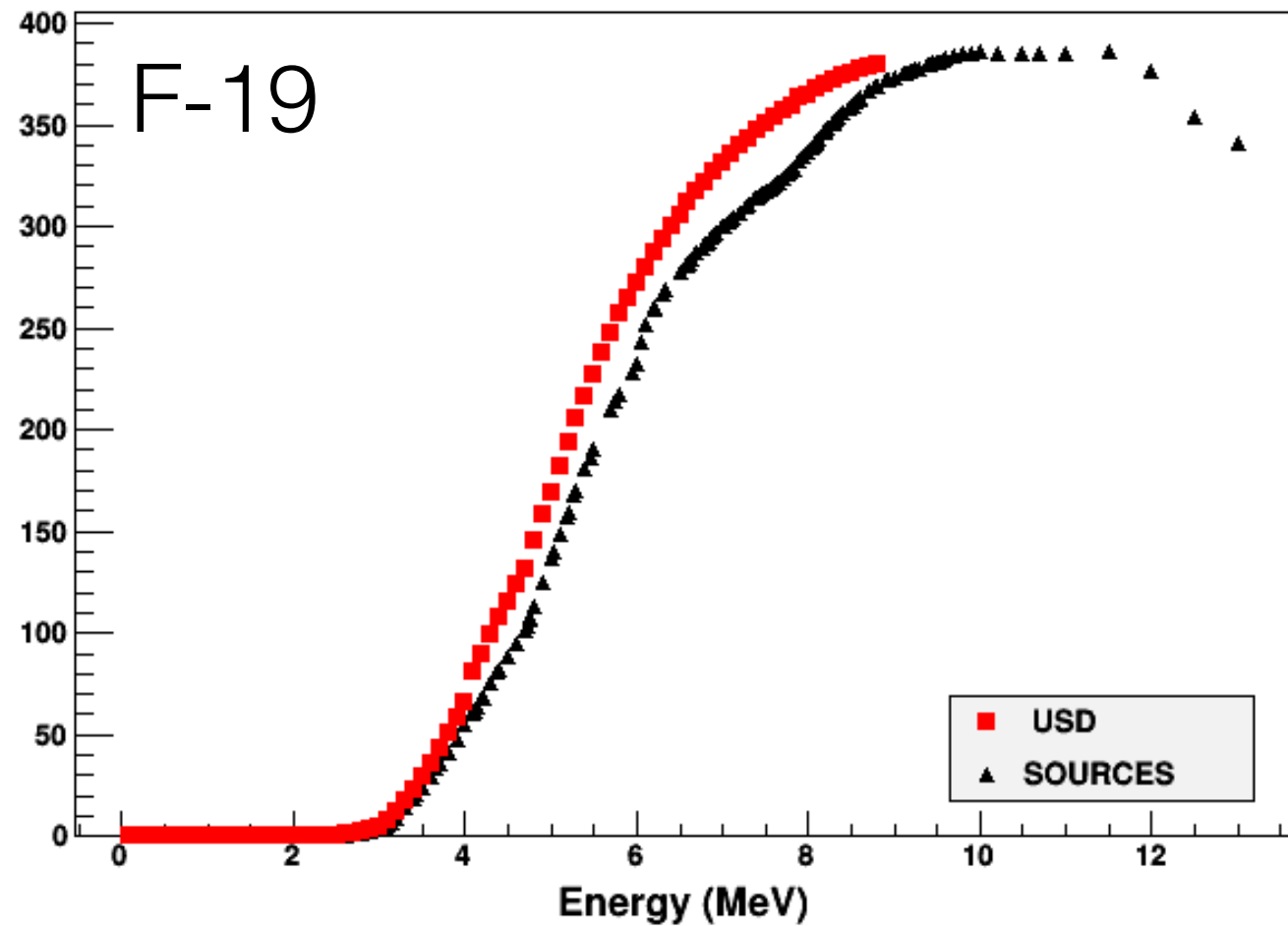
Composition: CF_2

6 0.333

9 0.667

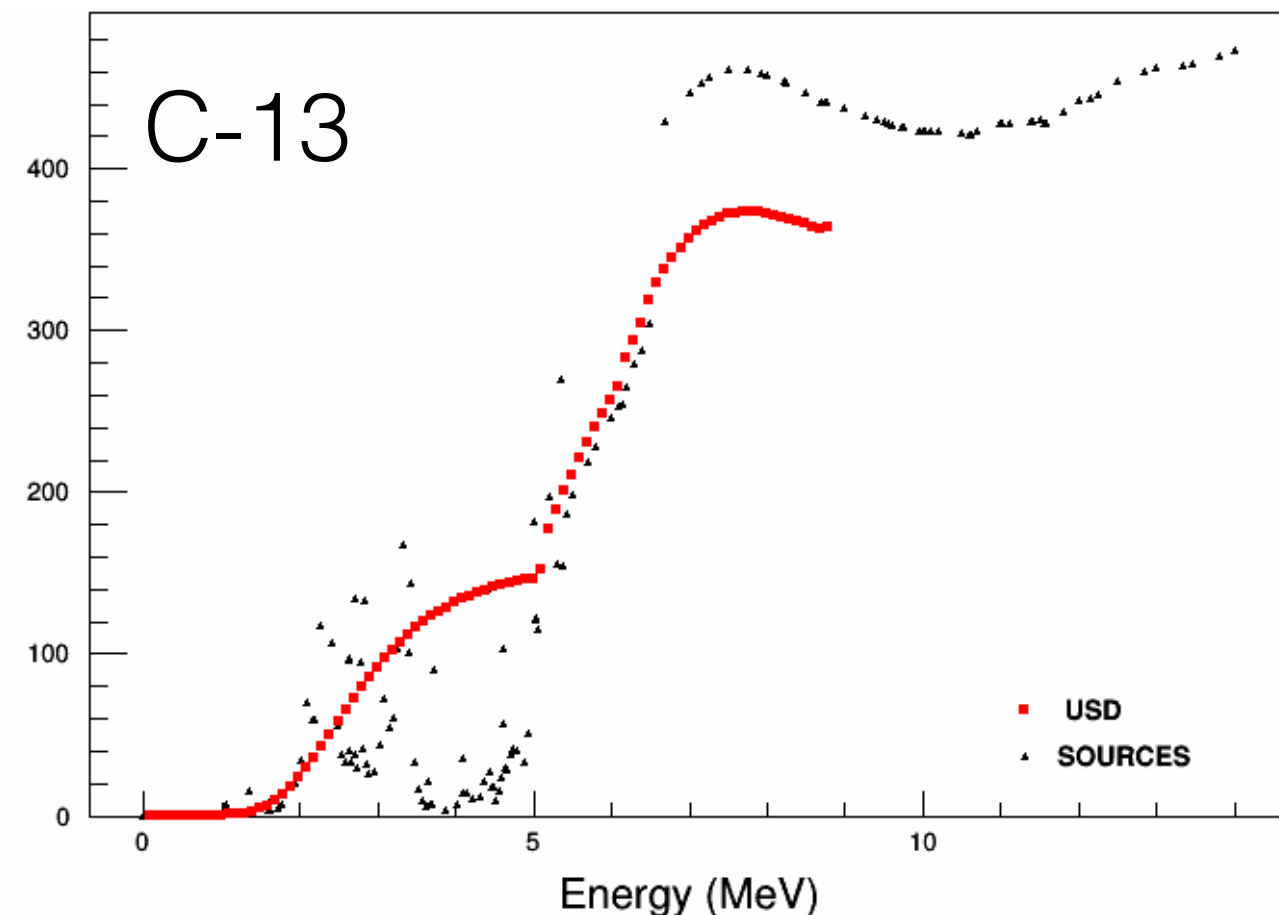
- Fluorine cross section (^{19}F)
SOURCES lib. vs. USD nprod.tot. - uploaded to dropbox
Tape3 in SOURCES libraries had a typo: 1MeV instead of 10MeV
- Spectra shape comparison
- Neutron yield calculations
- Comparison with previous results (M.Selvi @LRT 2013)

Cross Sections



Good agreement for F-19

Data +Empire2.19 for
SOURCES4 more
realistic at low energies
for C-13



SOURCES4A inputs

neutron in PTFE from ^{232}Th 1ppb

1 2 1

2 0 // Composition

6 0.333

9 0.667

500 10.0 0.0 // Energy Range in 500 bins

7 // Th isotope daughters and atom density

902320	5.70958E+12
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902280	780.202
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882240	4.08948
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862200	0.000719032
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842160	1.87517E-06
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832120	0.0470216
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842120	2.50497E-12
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2 4000 // Alpha targets

060130	0.003563
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090190	0.667
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neutron in PTFE from ^{238}U 1ppb

1 2 1

2 0 // Composition

6 0.333

9 0.667

500 10.0 0.0 // Energy Range in 500 bins

8 // U isotope daughters and atom density

922380	5.56536E+12
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922340	305709152
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902300	94086880
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882260	2023948
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862220	13.0767
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842180	0.00738355
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842140	6.44973E-09
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842100	473.155
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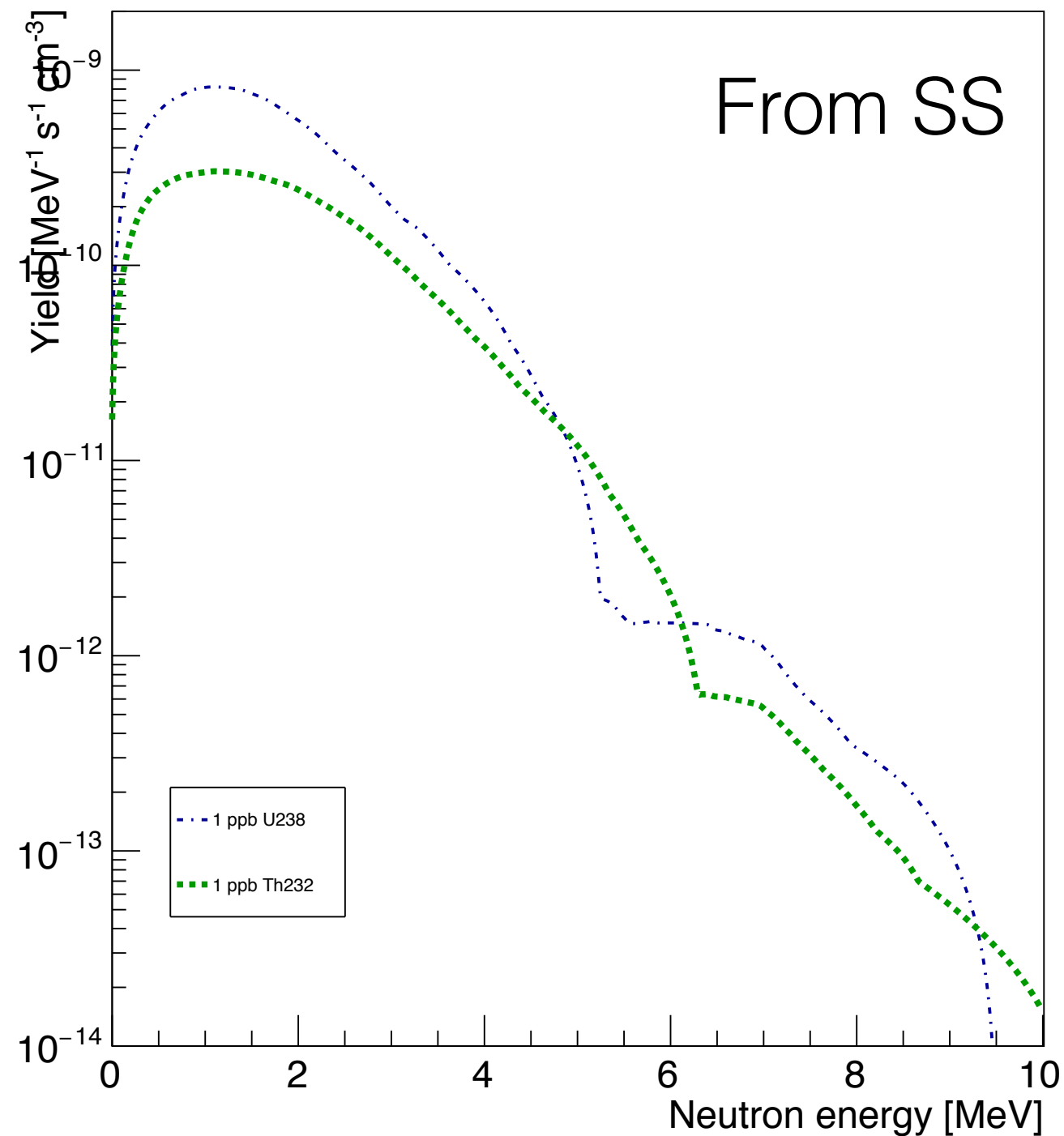
2 4000 // Alpha targets

060130	0.003563
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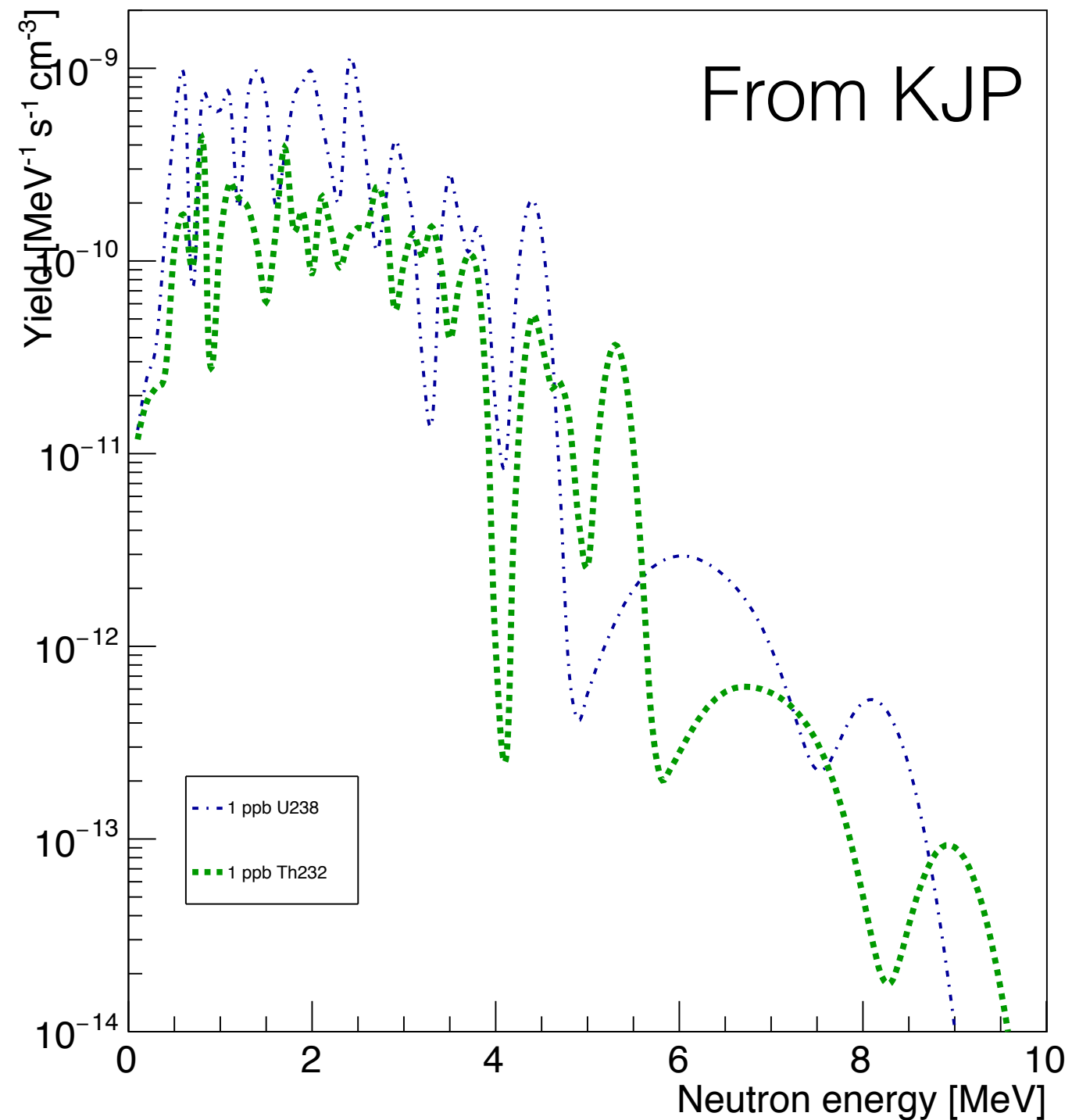
090190	0.667
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Spectra comparison (n/MeV s cm^3)

SOURCES4A alpha-n Neutron Yield on PTFE



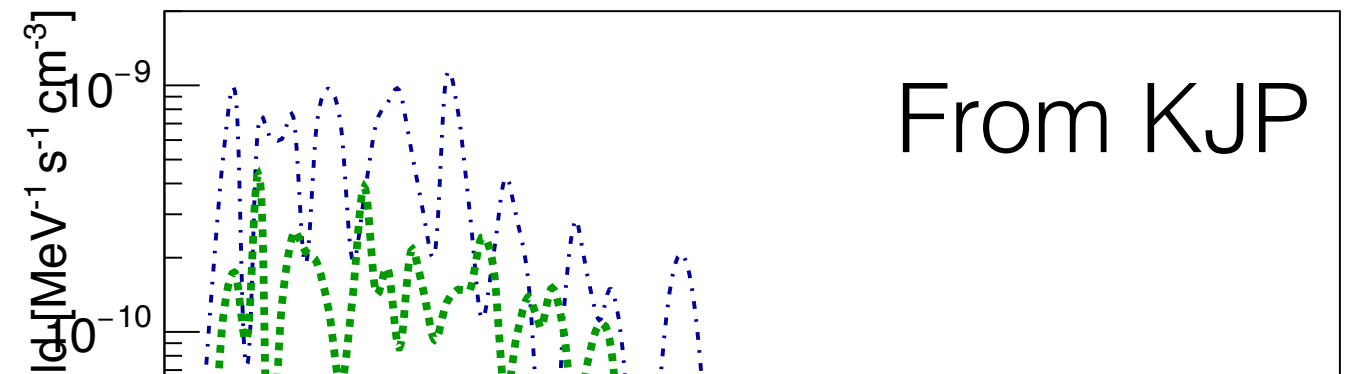
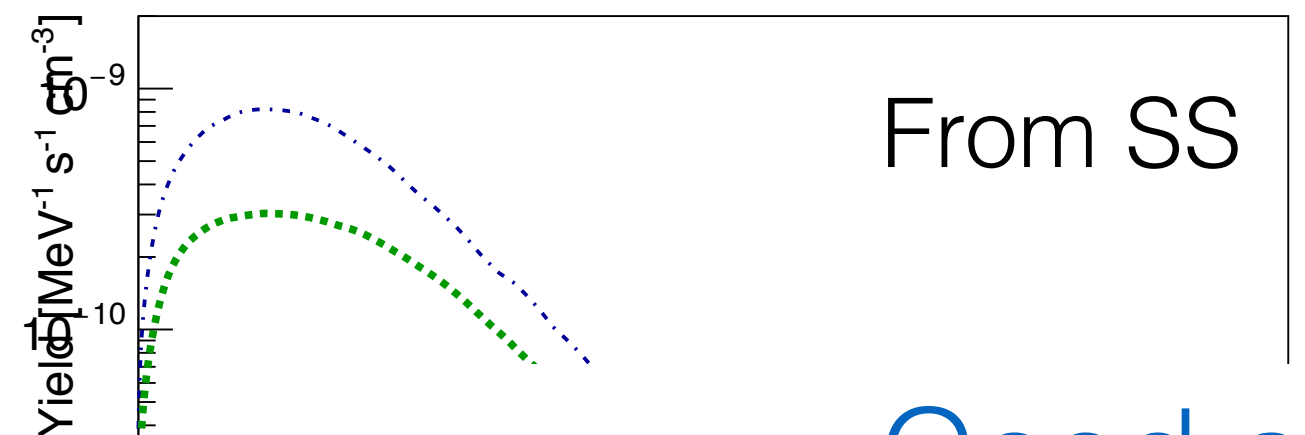
USD alpha-n Neutron Yield on PTFE



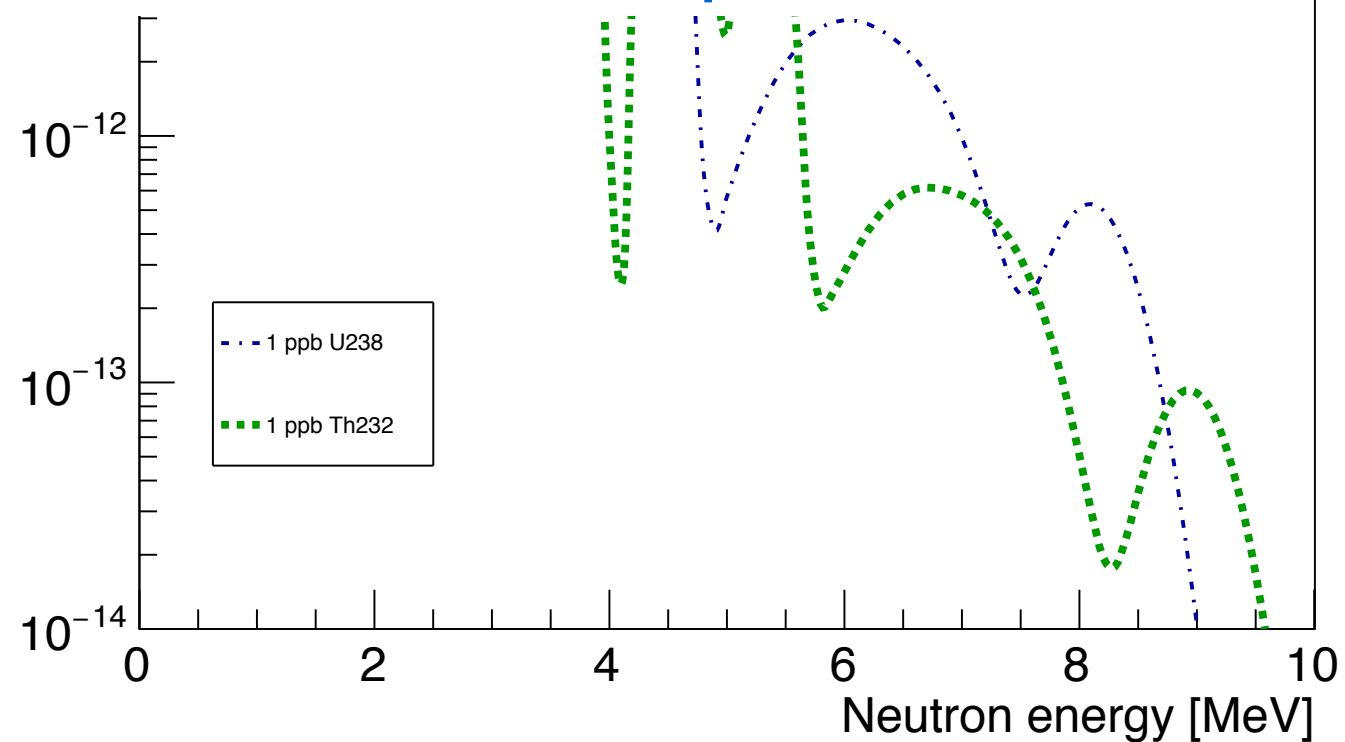
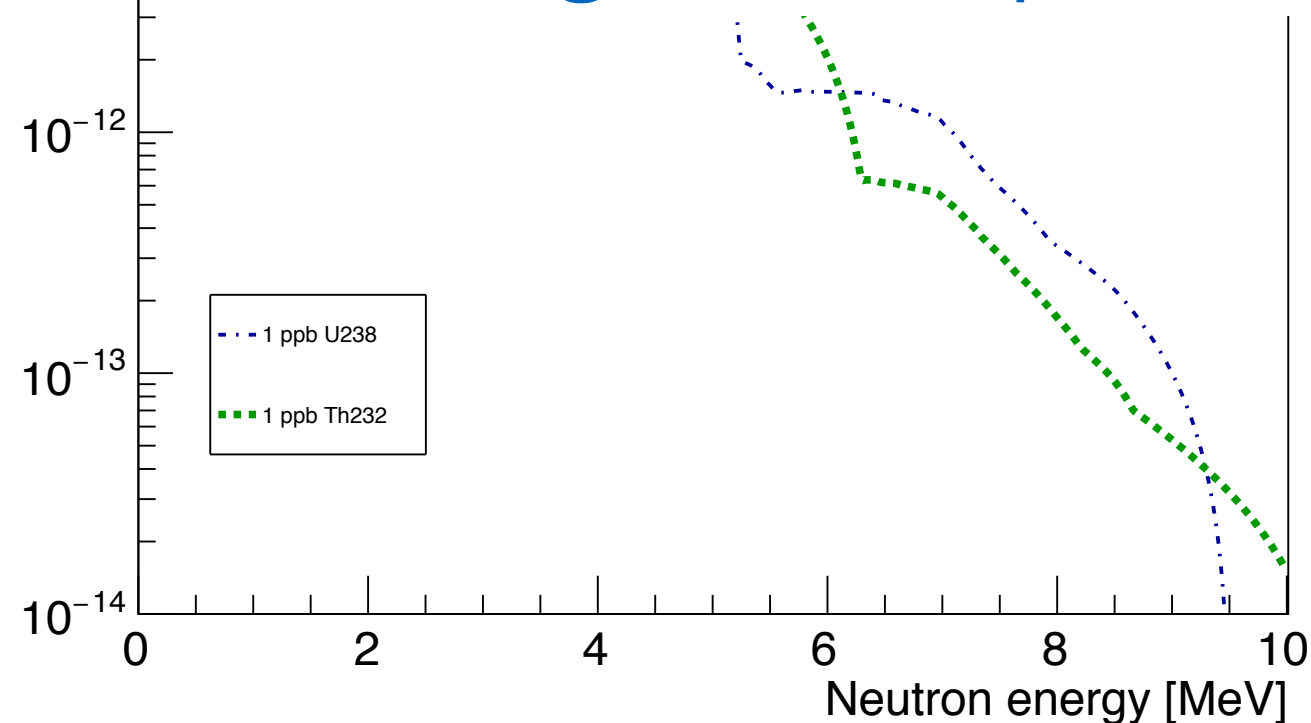
Spectra comparison (n/MeV s cm^3)

SOURCES4A alpha-n Neutron Yield on PTFE

USD alpha-n Neutron Yield on PTFE



Good agreement
although the spikes in the USD spectrum



Neutron Yield (n/s cm^3)

PTFE	SOURCES n/s/cm^3	USD n/s/cm^3	Ratio SOURCES/USD
^{232}Th	7.762E-10	5.42E-09	0.14
^{238}U	1.807E-09	1.60E-08	0.11

Discrepancy between SOURCES4 and USD is roughly about one order of magnitude.

Since the good agreement in the spectrum shape, It might be that the USD values quoted in the table are “ n/MeV/s/cm^3 ” instead of “ n/s/cm^3 ”. -> to be checked

Comparison w/ M.Selvi LRT13

Ratio SOURCES/ USD	LRT13	This work
^{232}Th	1.72	0.14
^{238}U	1.03	0.11

Previous USD-SOURCES showed a maximum of a factor 2 of difference.

Ongoing

- Compare C and F independently
- Check Al_2O_3