Update on actions

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Update of Database as of today

39 new data sets from measurements collected

(p,p’) Method: 25 data files

NRF Method: 40 data files

Oslo Method (including IO, BO): 172 data files

HIgS: 4 data files

Missing data

Came across old publications with Oslo data not yet included:

51Ti

197Au, 198Au, 195Pt: unable to get data and sent to the IAEA for extraction from figure

Oslo data assessment

Assess high-energy Oslo data to remove spurious effects:

In cases where data were removed comments were added into the readme files.

Clarifications (HIgS)

- Normalization of the HIgS data to the ELBE data and the treatment of uncertainties

"The normalization is performed for most measurements via known NRF cross sections of individual resolved ground-state decays observed in both, the HIgS experiment and the bremsstrahlung experiment at ELBE in Dresden and at DHIPS in Darmstadt. The uncertainties are determined from the counting stats in the spectra and the ones from the normalization with the NRF cross sections obtained in bremsstrahlung measurements."

- Model dependencies associated with the PSF extracted from (p,p') data

No response yet.

Clarifications (p,p’)

We have some idea on the magnitudes of the corresponding uncertainties although it is not always possible to do a rigorous quantitative analysis. Here, I only discuss impact on our experimental PSF. If you are also interested in the extraction of the polarizability additional uncertainties need to be considered for the high-energy part. There are 3 sources of model dependence in the analysis of the (p,p') data

1. DWBA calculations entering into the multipole decomposition analysis. Calculations for the different multipoles are done on the level of QRPA. We use an effective proton-nucleus interaction (Love-Franey) to describe the momentum transfer (or angular) dependence. We did some test calculations using different QRPA input and another effective interaction based on the Paris potential and concluded that the model dependence is on the level of a few % (definitely less than 5%).

2. Conversion of E1 cross sections into equivalent photoabsorption cross sections. This is a well established technique and from the comparison with real-photon probes shown in our papers about 208Pb we conclude that the error contribution is much smaller than that from the experimental systematic errors.

3. Conversion of M1 cross sections to equivalent electromagnetic M1 strength. This is decribed in J. Birkhan et al. Phys. Rev. C 93, 041302(R) (2016) including a detailed discussion of the model- dependent uncertainties.

Assign quality indicator to OM data

- Full experimental uncertainties including Gg and Do uncertainties
- Full model uncertainties
- D0 available
- Gg available
- Shape Method applied
- Published after 2013 (spin distribution issue in code)

Assign quality indicator to OM data

A total of 172 data sets were considered

Quality Indicator 1: 67 data sets

Quality Indicator 2: 28 data sets

Quality Indicator 3: 26 data sets

Quality Indicator 4: 45 data sets

Quality Indicator 5: 3 data sets

Review multiple OM measurements of the same nuclide using different reactions and recommend data for evaluation

- Publications prior to 2014 have a normalization problem in code (spin distribution) which leads to absolute value problems. For evaluations only data in publications after 2013 should be considered. See Phys. Rev. C **98**, 054310 (2018) which also includes renormalized Dy isotopes.

- (3He,3He)162Dy and (4He,4He)162Dy
- (3He,3He)161Dy and (4He,4He)161Dy
- 181Ta(d,d') at 12.5 MeV and 15 MeV, 181Ta(3He,3He')

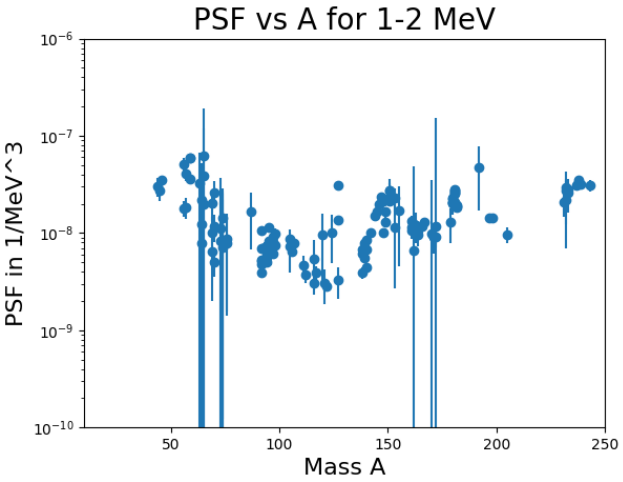
Apply Shape Method on 96Mo and 196Pt to confirm the shape and normalization and compare with the other methods

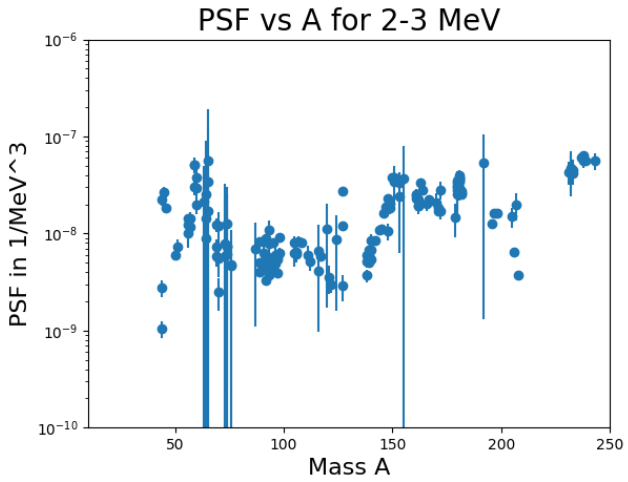
- From last meeting:
- 106Cd assigned to PhD student
- 96Mo: not a suitable data set
- 196Pt to be looked into

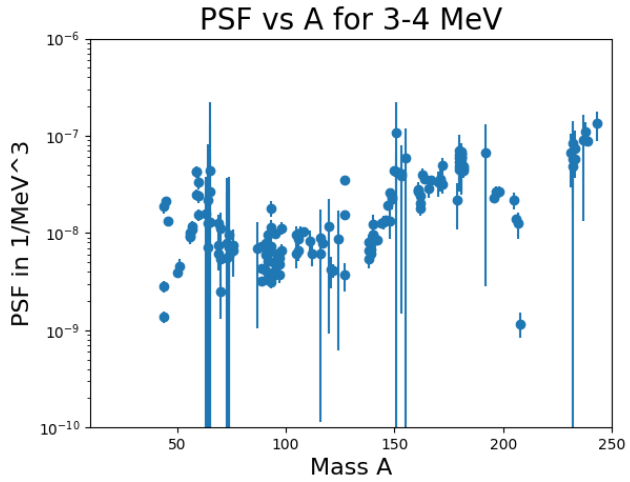
- 106Cd ongoing. Projected completion in ~1 years.

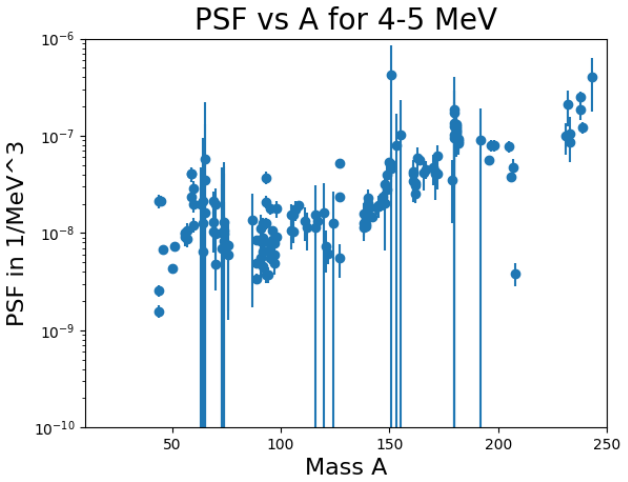
Systematic comparison of PSF data averaged over 1 MeV bins across the measured photon energy range, as a function of A, Z, N, N-Z, β_2, to identify trends and/or outliers: (n,g), OM, NRF, (p,g), (p,p'), photonuclear (in relevant energies)

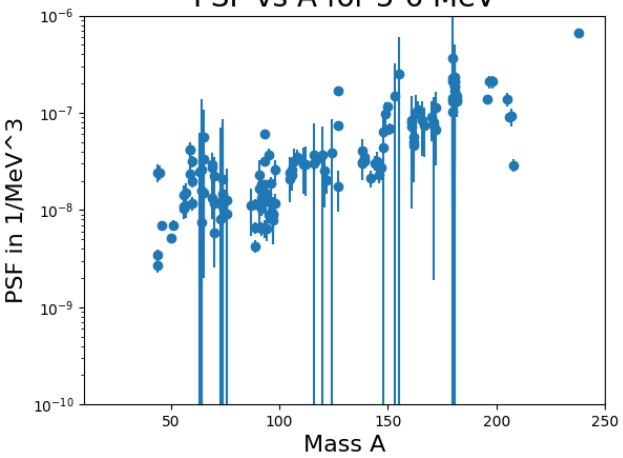
PSF from Oslo Method

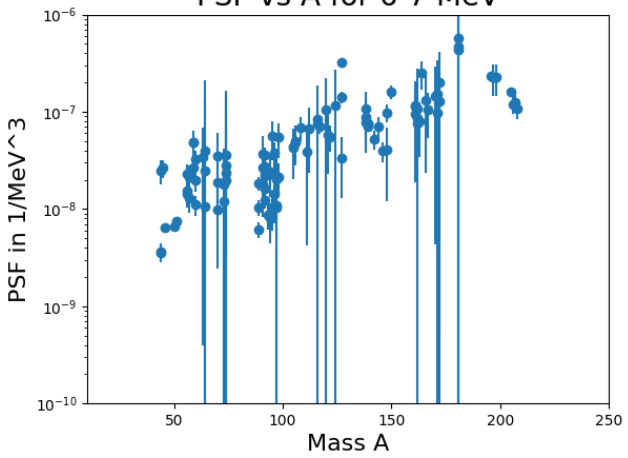


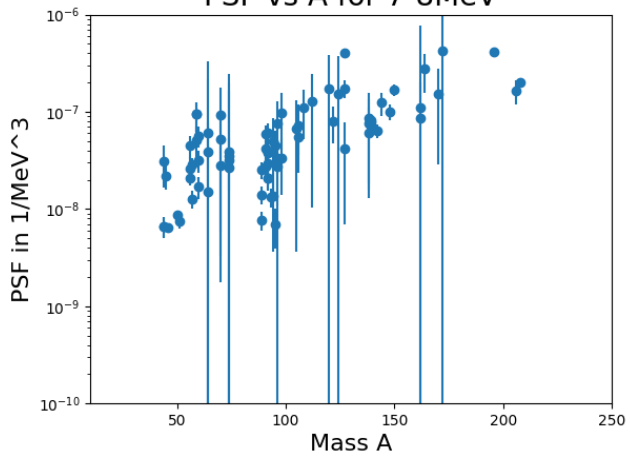


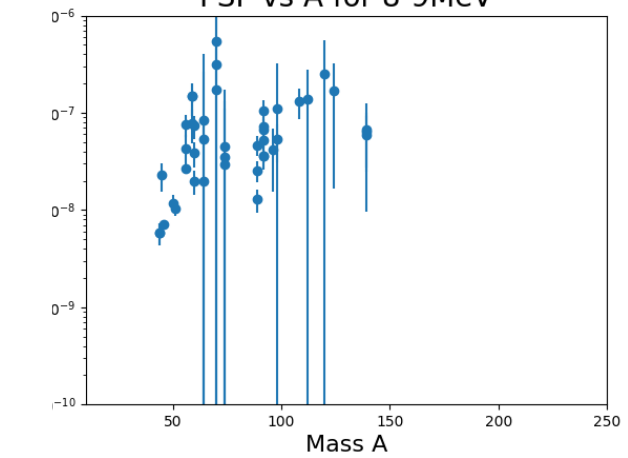




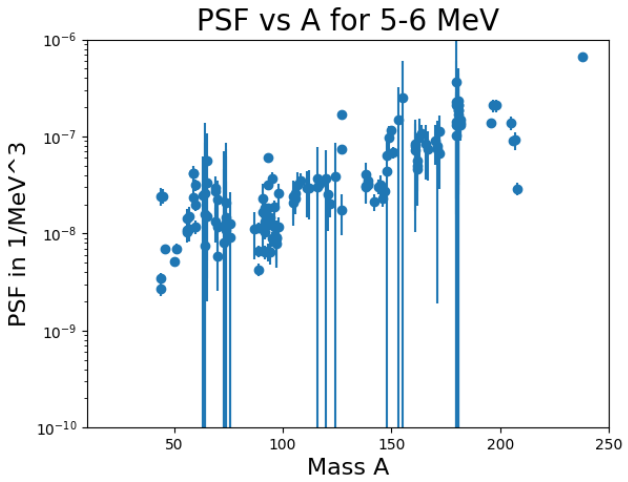


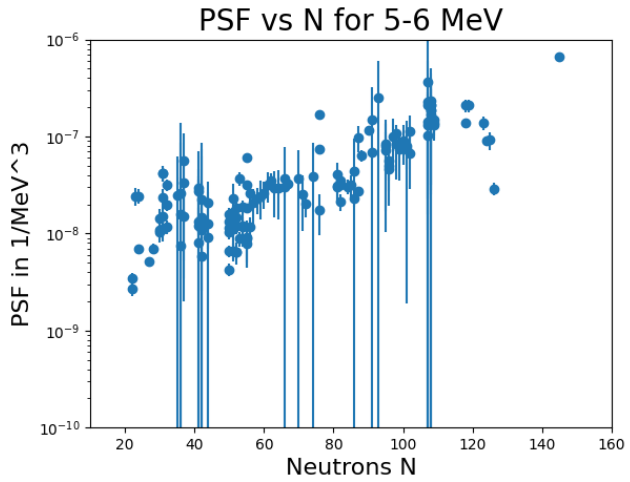


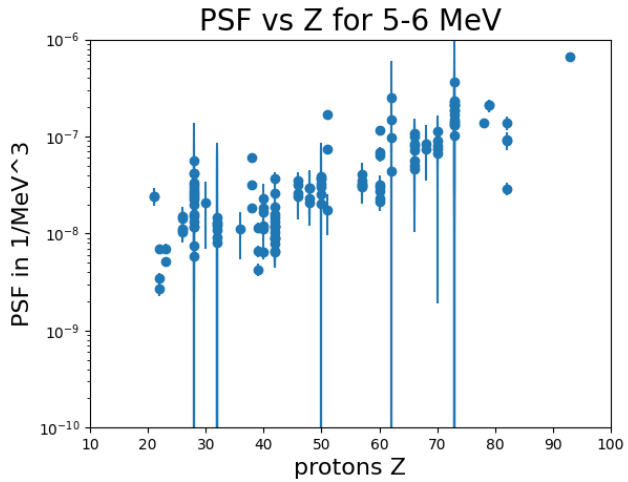


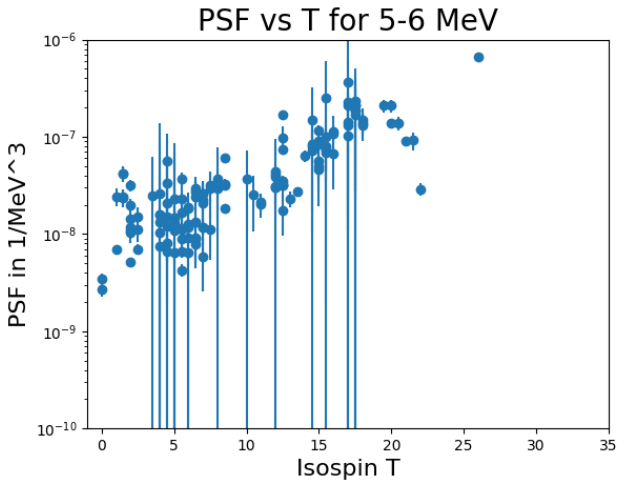


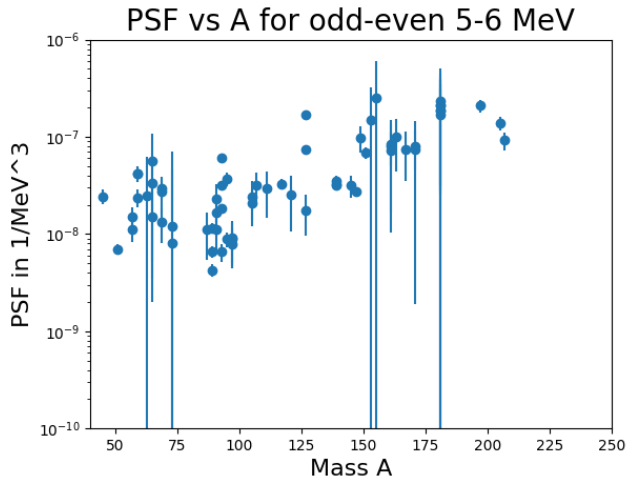
PSF from Oslo Method vs A, Z, N, T and for e-e, o-e

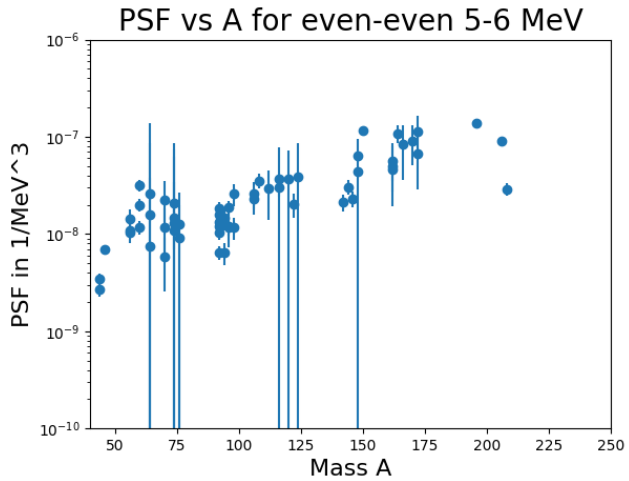




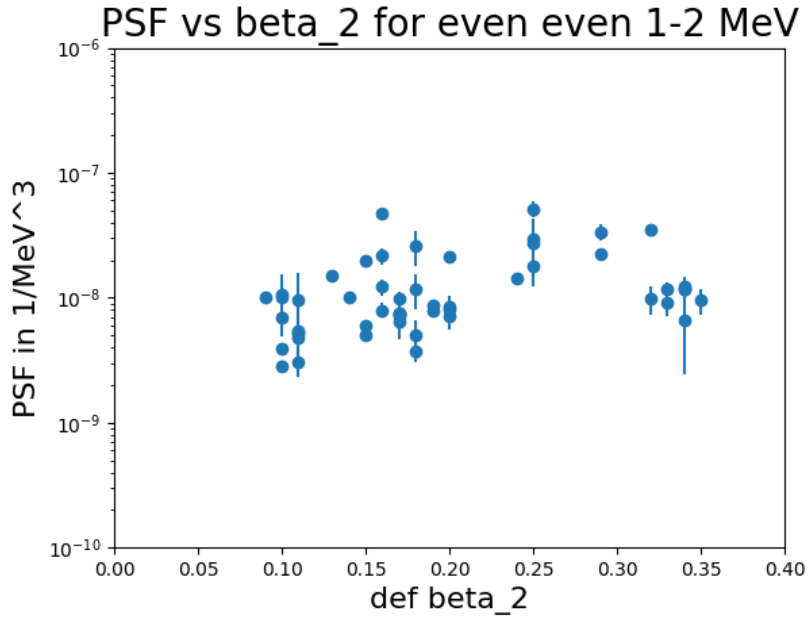


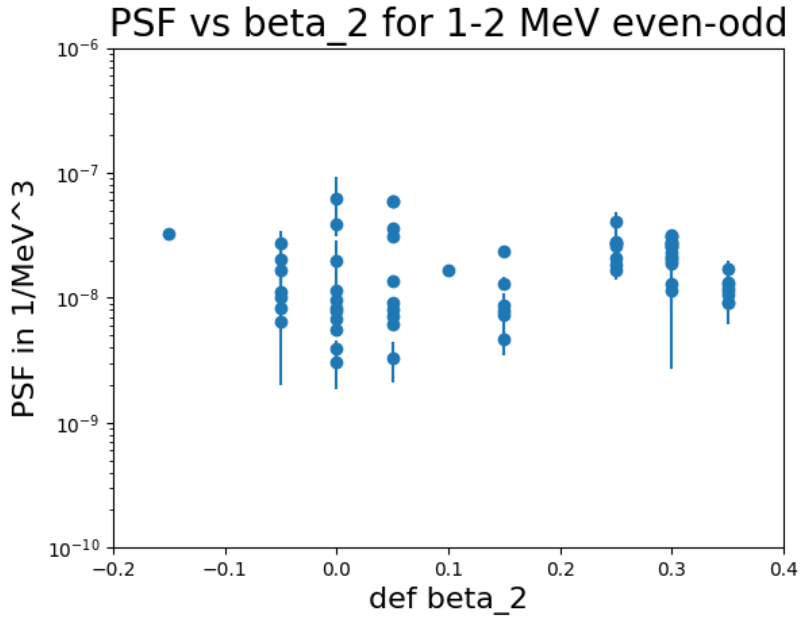


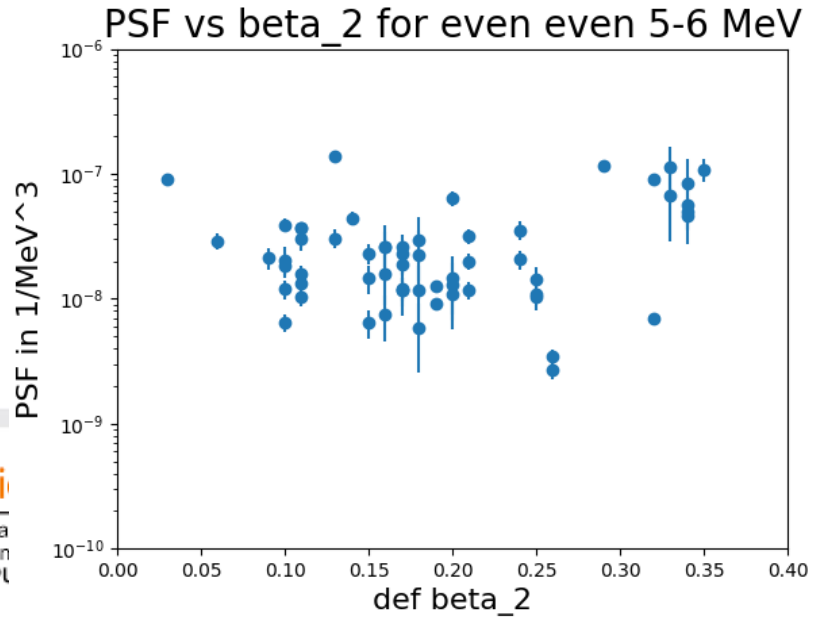


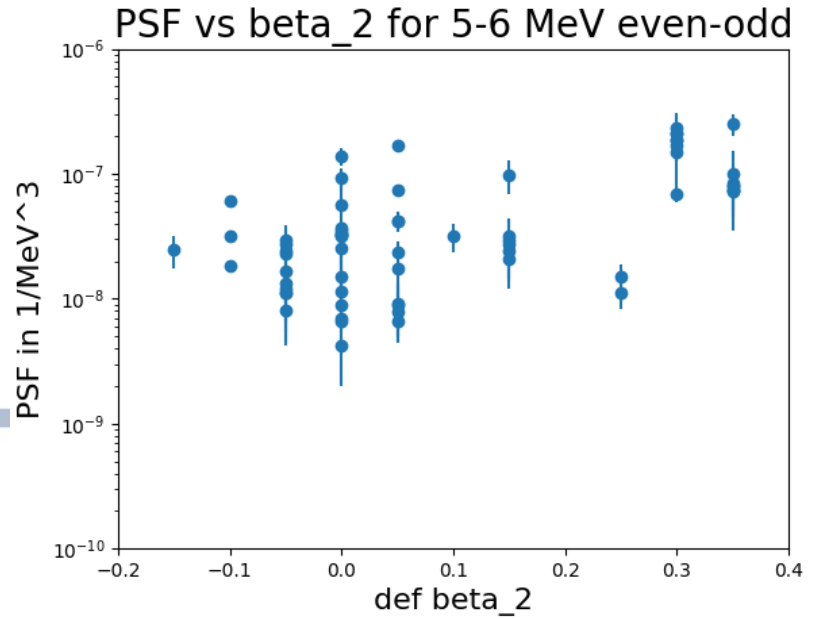


PSF from Oslo Method vs beta2

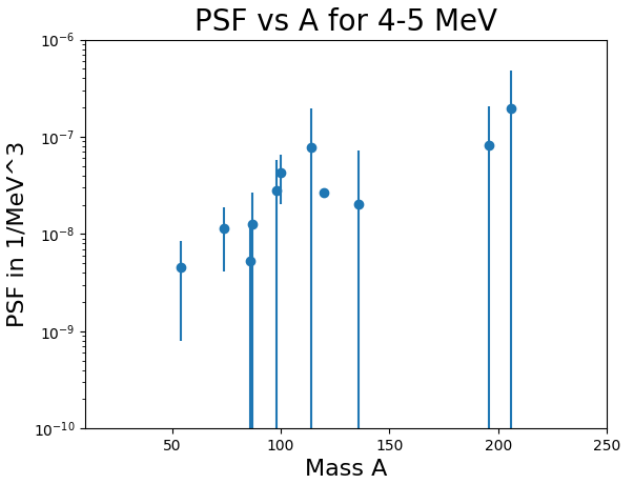


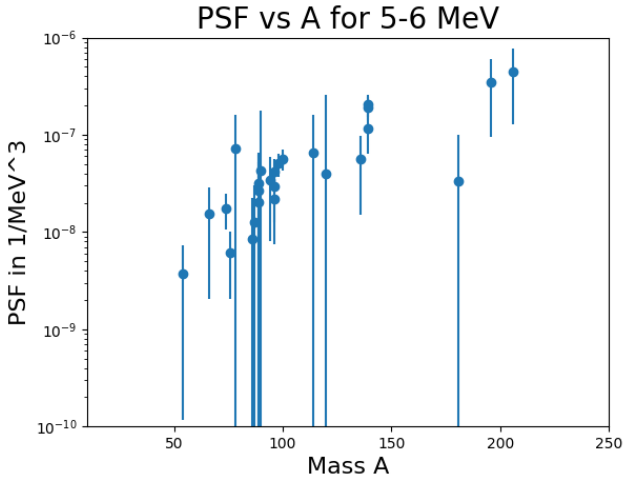


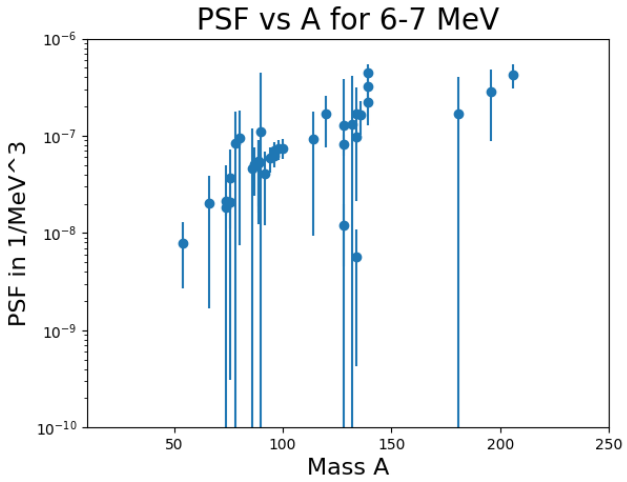


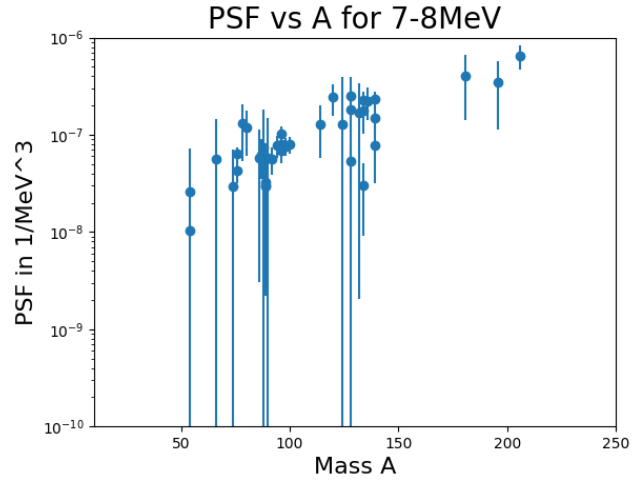


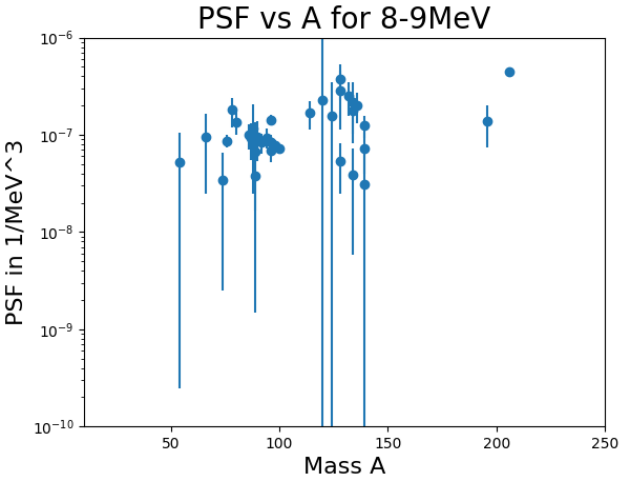
PSF from NRF

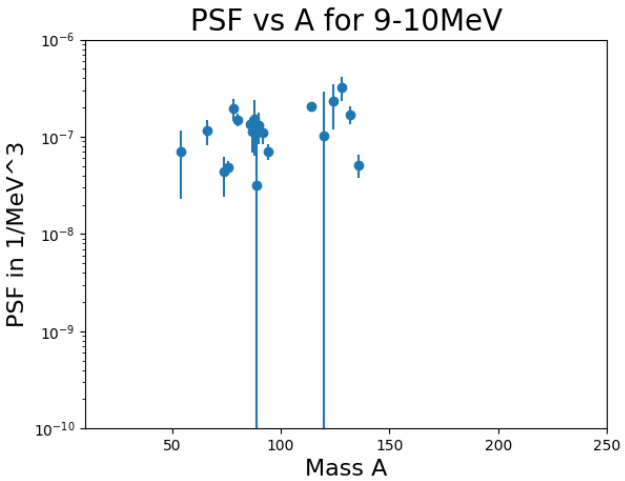

PSF vs A for 4-5 MeV
PSF in 1/MeV^3
Mass A

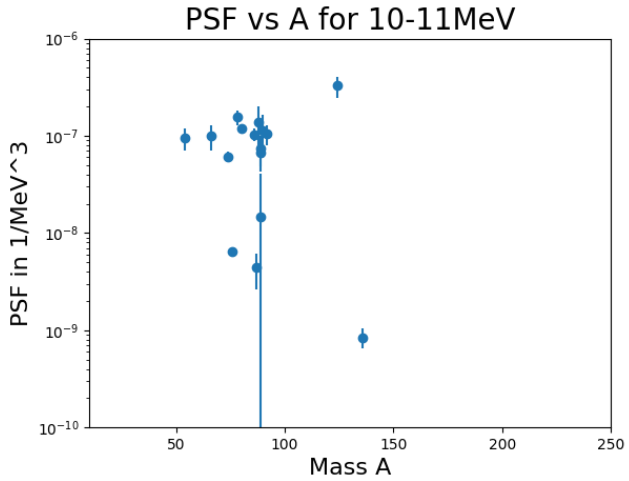

PSF vs A for 5-6 MeV
PSF in 1/MeV^3
Mass A

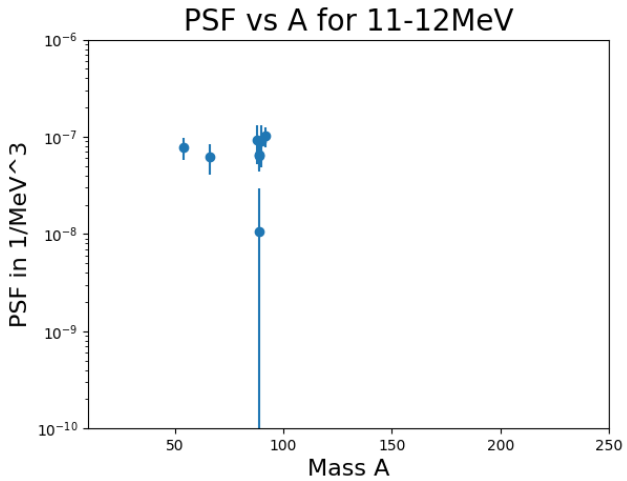

PSF vs A for 6-7 MeV
PSF in 1/MeV^3
Mass A


PSF vs A for 7-8MeV
PSF in 1/MeV^3
Mass A

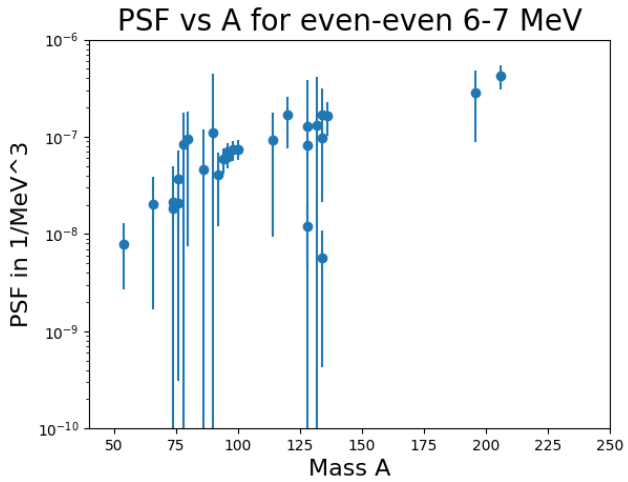

PSF vs A for 8-9MeV
PSF in 1/MeV^3
Mass A

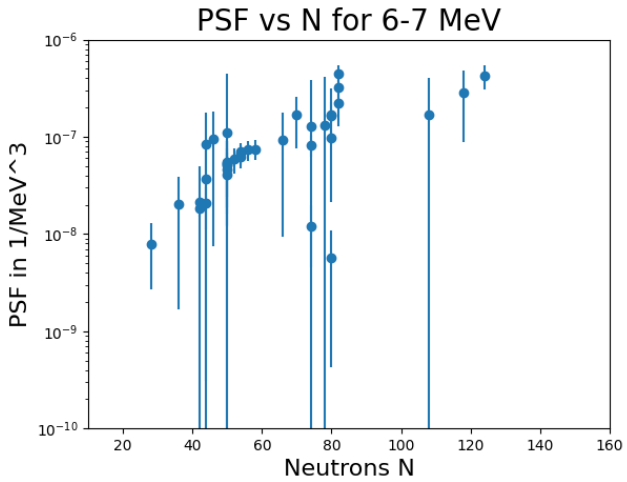

PSF vs A for 9-10MeV
PSF in 1/MeV^3
Mass A

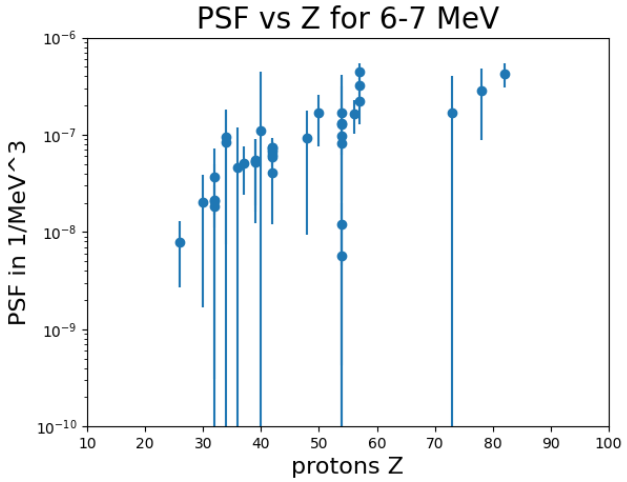

PSF vs A for 10-11MeV
PSF in 1/MeV^3
Mass A

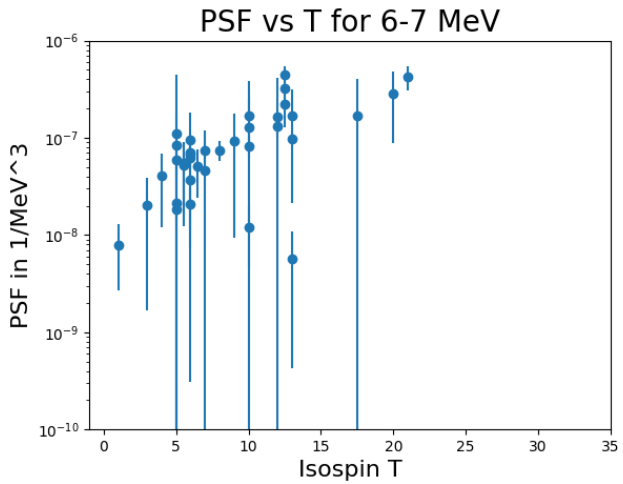

PSF vs A for 11-12MeV
PSF in 1/MeV^3
Mass A

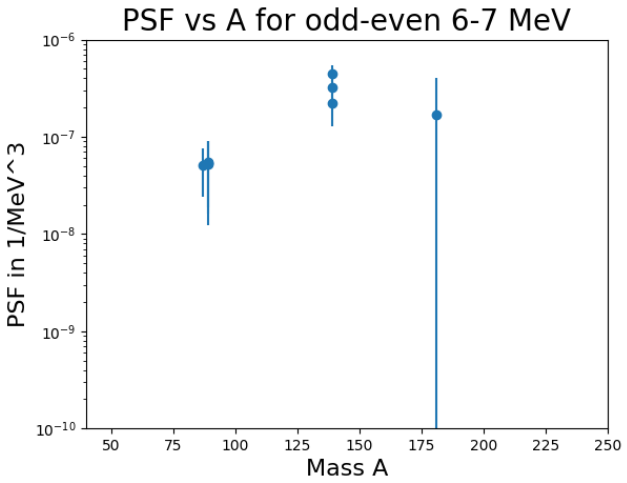
PSF from NRF vs A, Z, N, T and for e-e, o-e

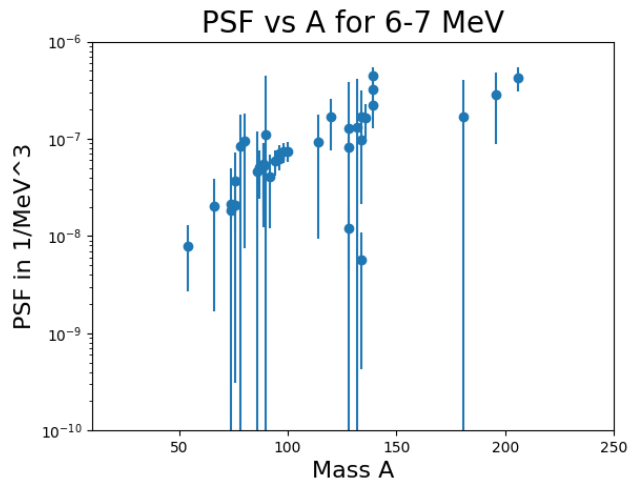




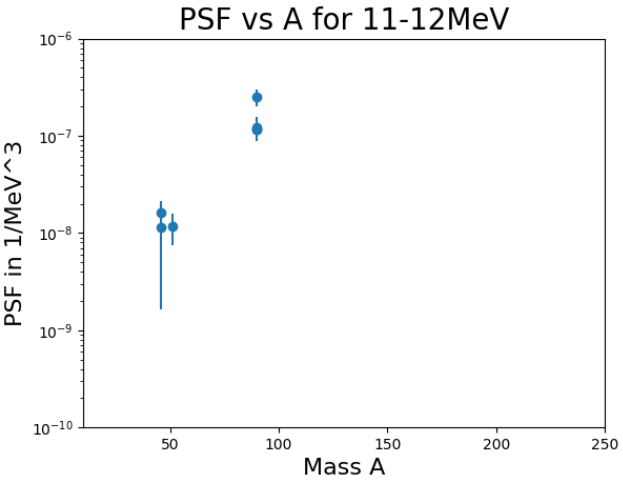


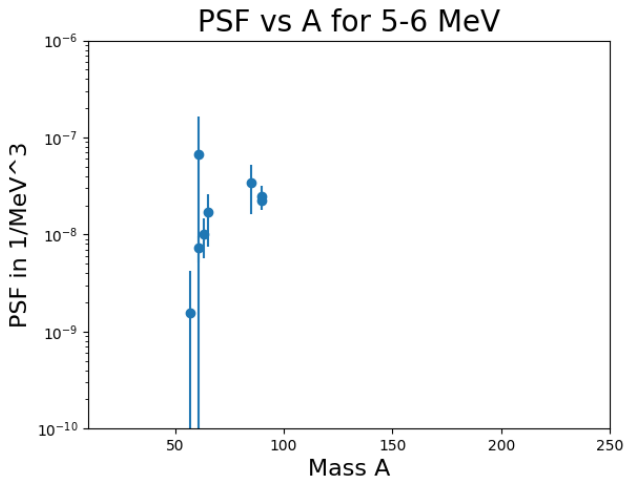


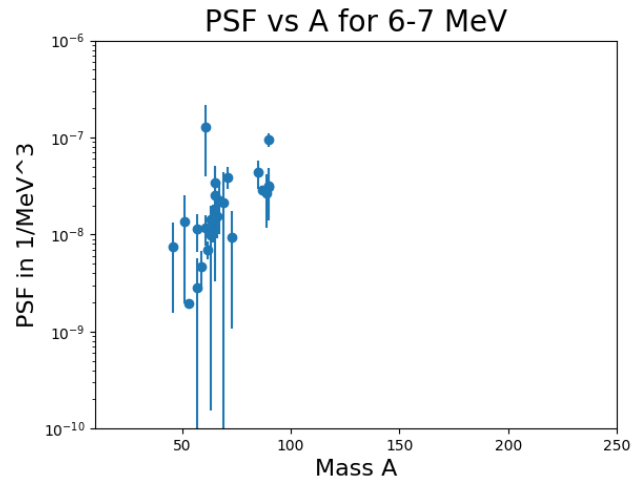


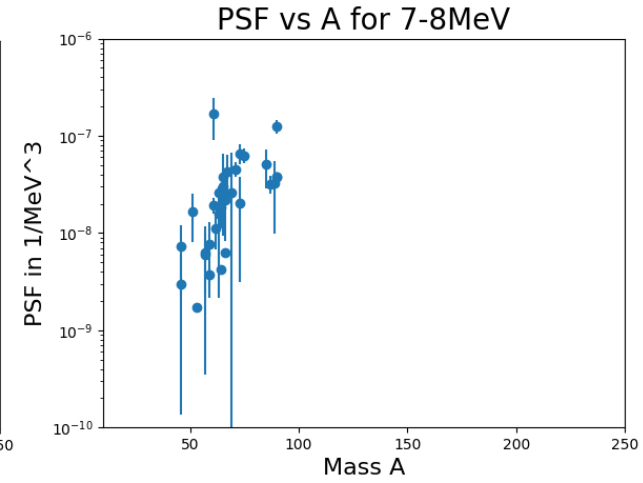


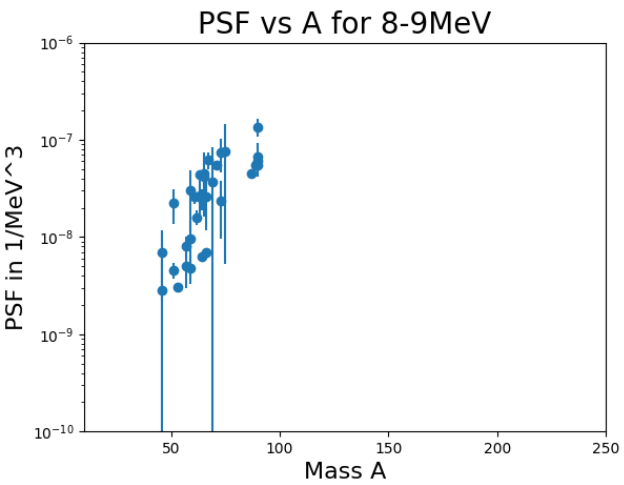
PSF from (p,g)

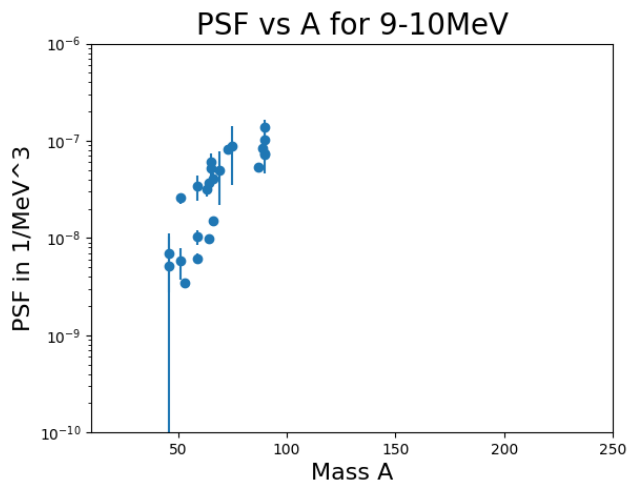

PSF vs A for 11-12MeV
PSF in 1/MeV^3
Mass A

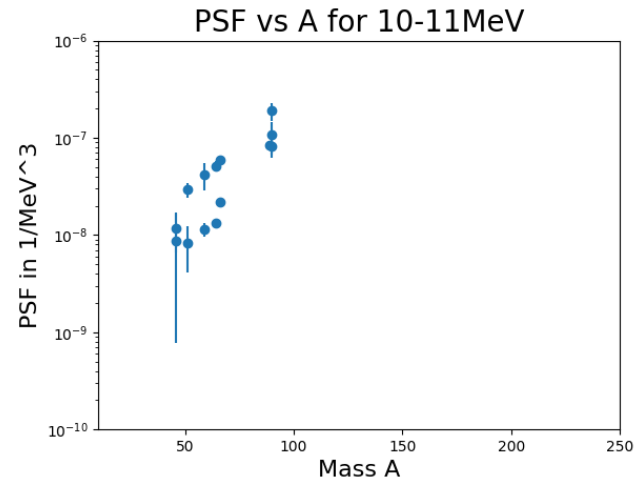

PSF vs A for 5-6 MeV
PSF in 1/MeV^3
Mass A


PSF vs A for 6-7 MeV
PSF in 1/MeV^3
Mass A

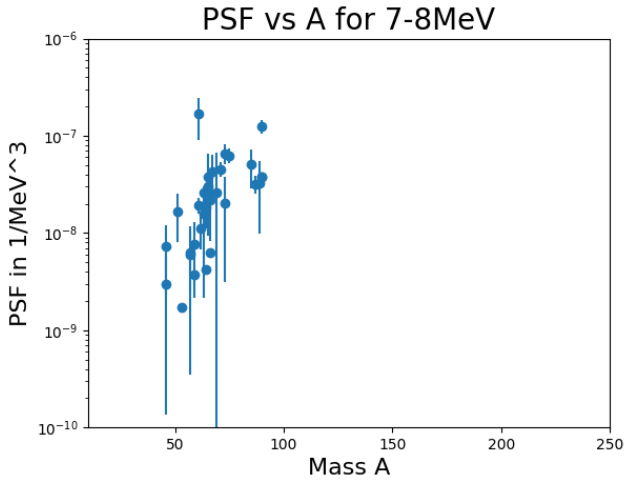

PSF vs A for 7-8MeV
PSF in 1/MeV^3
Mass A

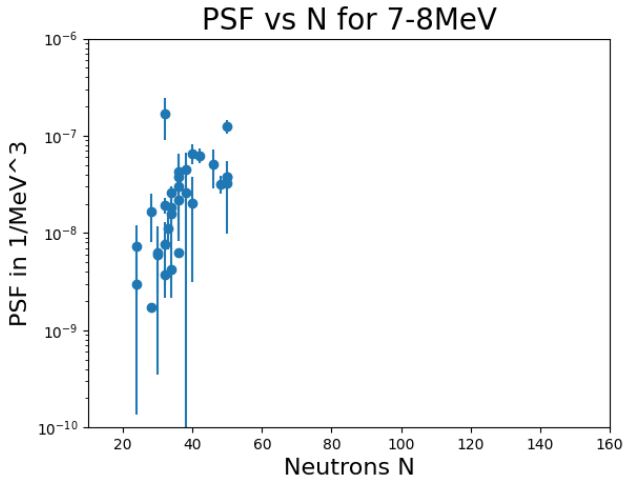

PSF vs A for 8-9MeV
PSF in 1/MeV^3
Mass A

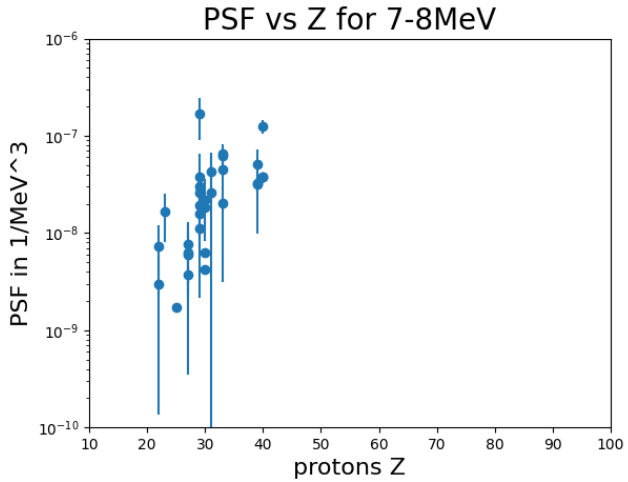

PSF vs A for 9-10MeV
PSF in 1/MeV^3
Mass A

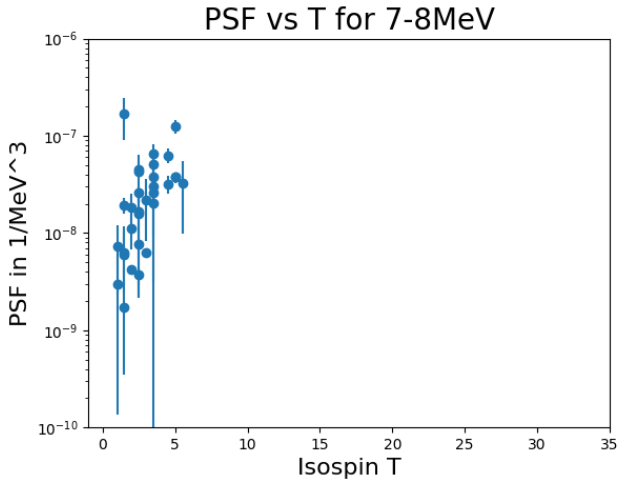

PSF vs A for 10-11MeV
PSF in 1/MeV^3
Mass A

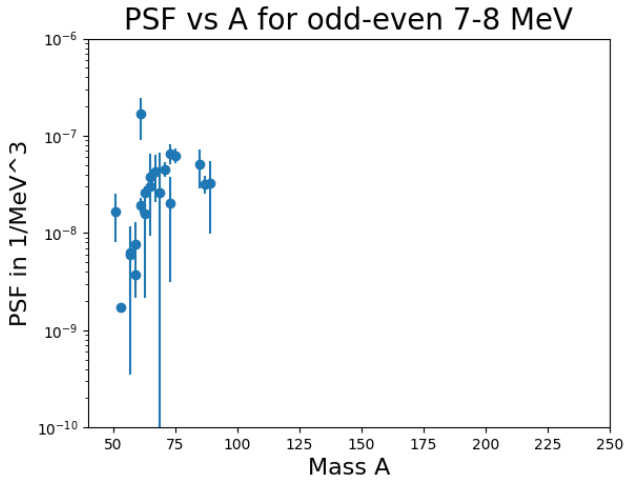
PSF from (p,g) vs A, Z, N, T and for e-e, o-e

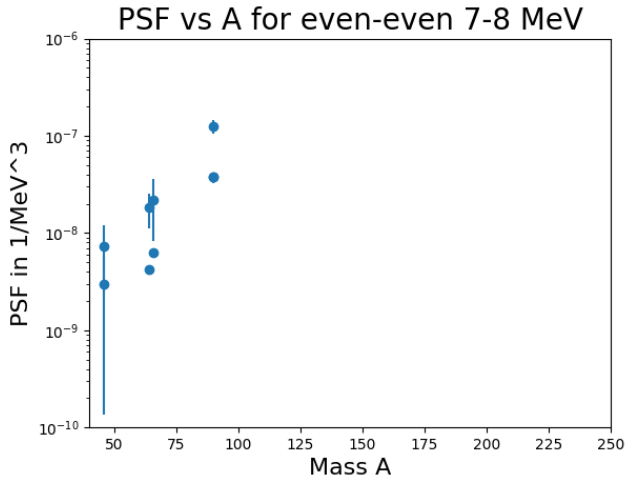




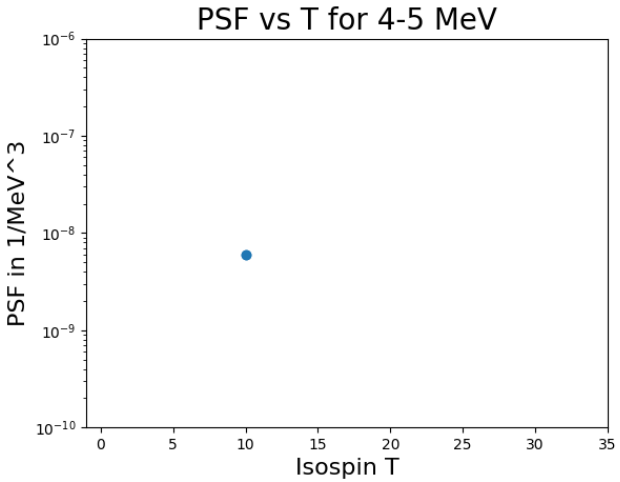


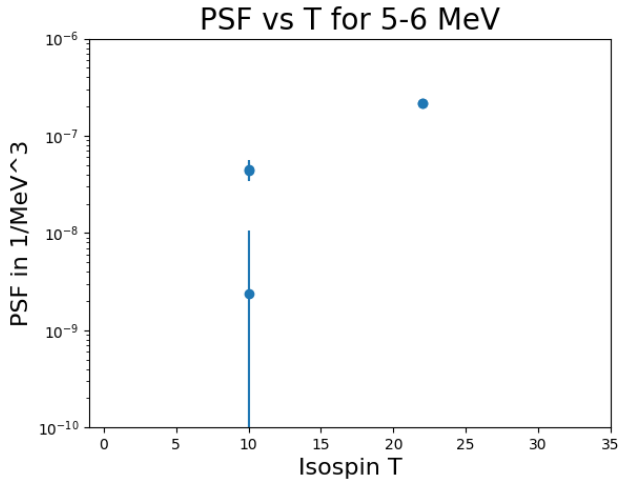


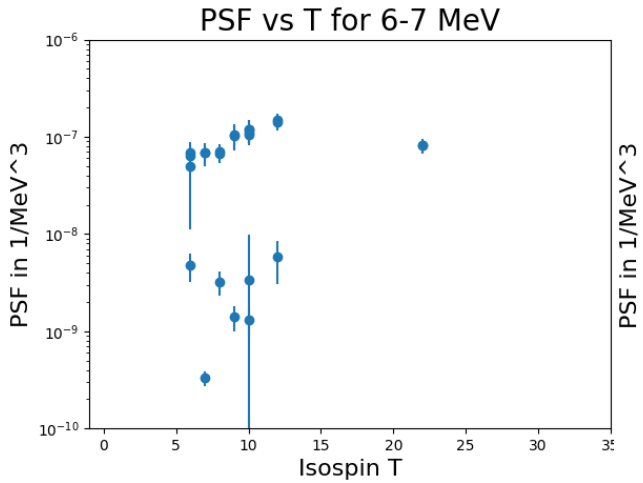


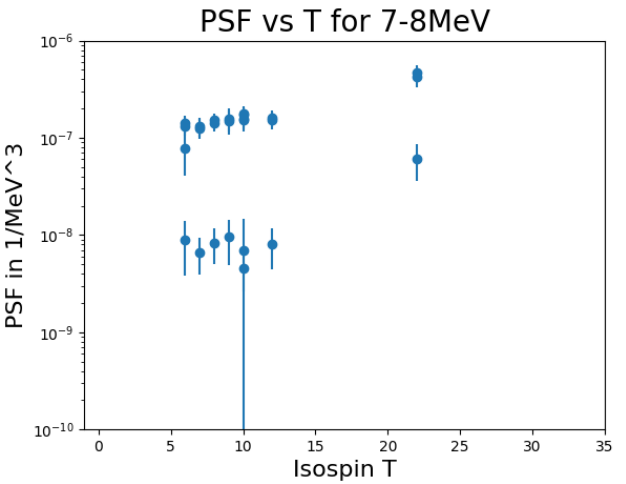


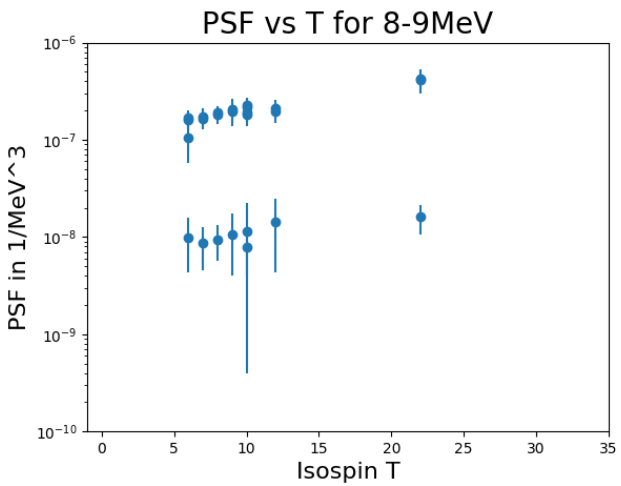
PSF from (p,p')

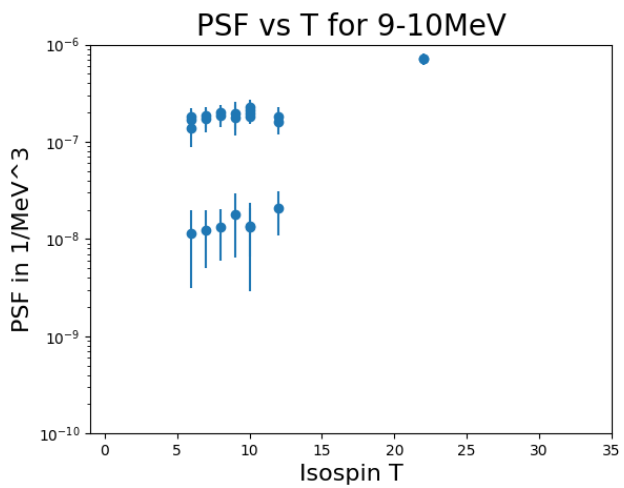

PSF vs T for 4-5 MeV
PSF in 1/MeV^3
Isospin T

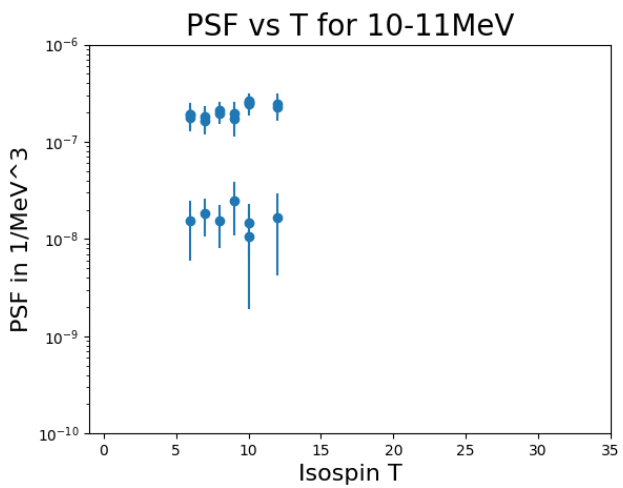

PSF vs T for 5-6 MeV
PSF in 1/MeV^3
Isospin T

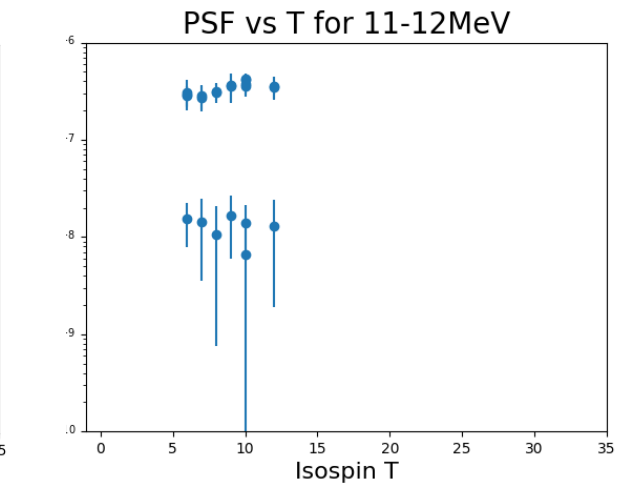

PSF vs T for 6-7 MeV
PSF in 1/MeV^3
Isospin T


PSF vs T for 7-8MeV
PSF in 1/MeV^3
Isospin T

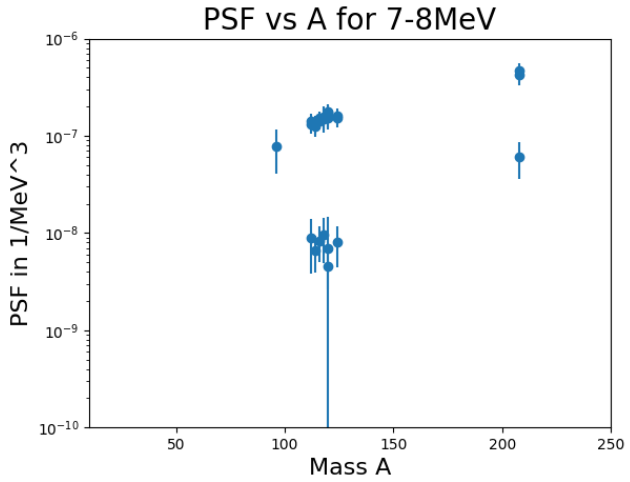

PSF vs T for 8-9MeV
PSF in 1/MeV^3
Isospin T

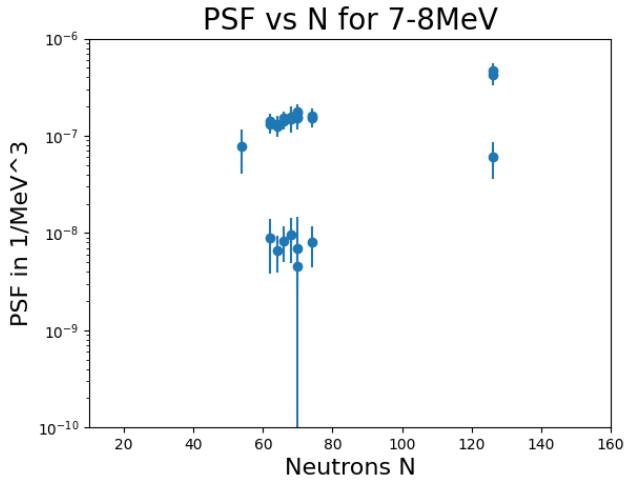

PSF vs T for 9-10MeV
PSF in 1/MeV^3
Isospin T

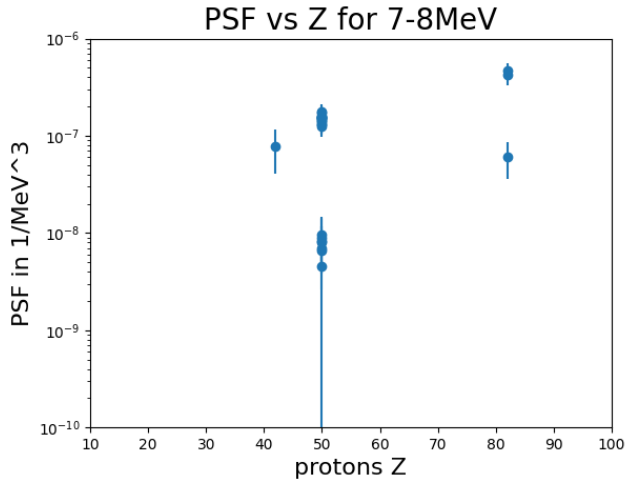

PSF vs T for 10-11MeV
PSF in 1/MeV^3
Isospin T

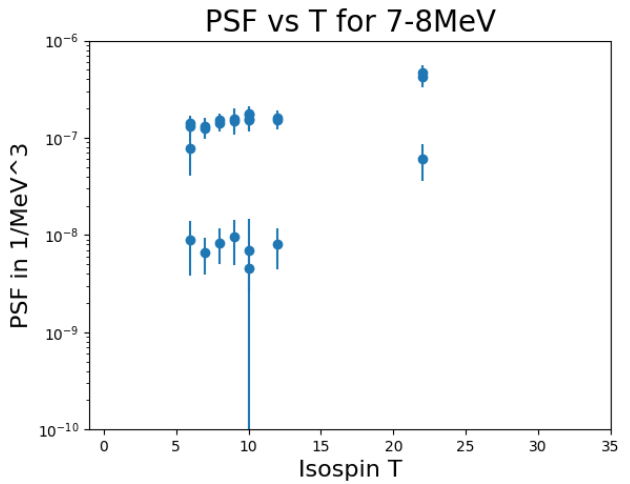

PSF vs T for 11-12MeV
Isospin T

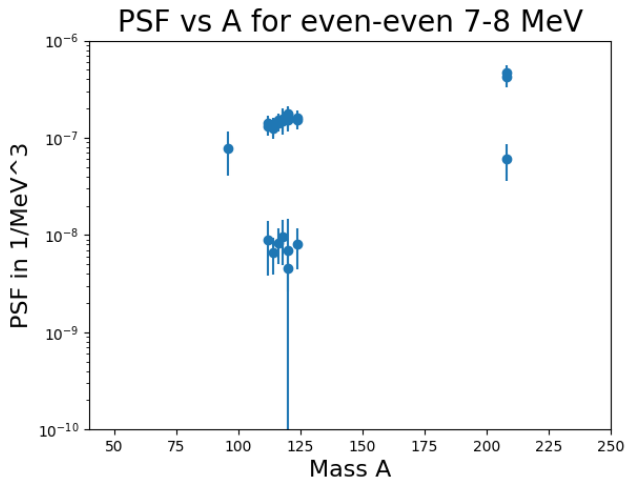
PSF from (p,p') vs A, Z, N, T and for e-e



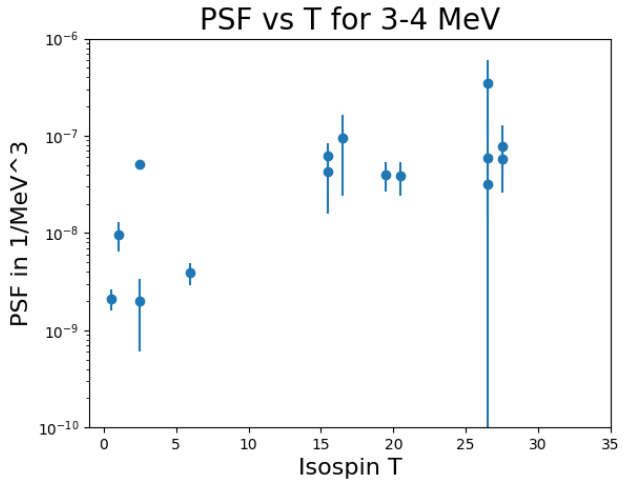


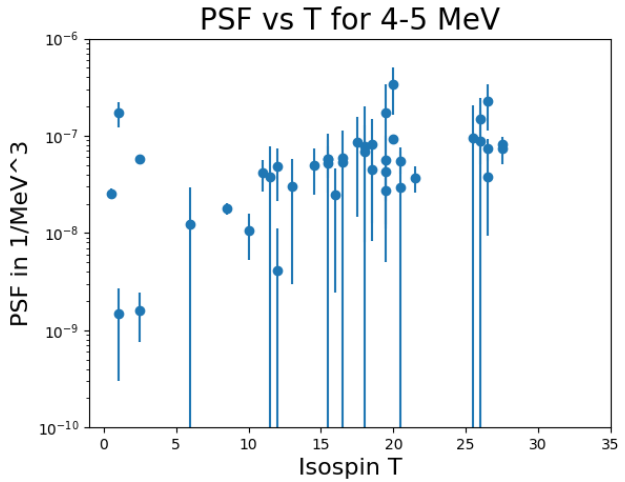


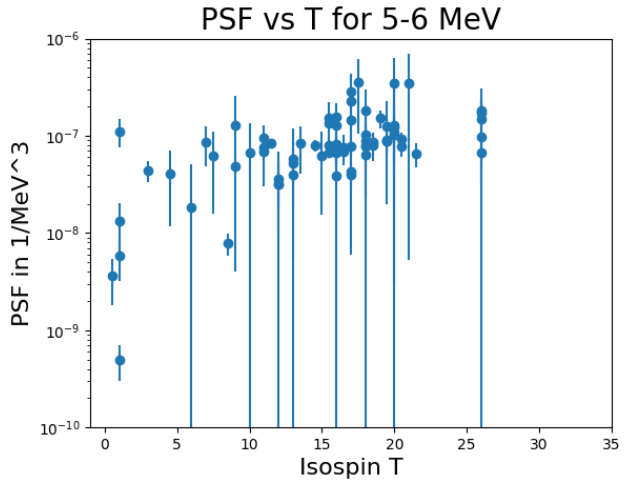


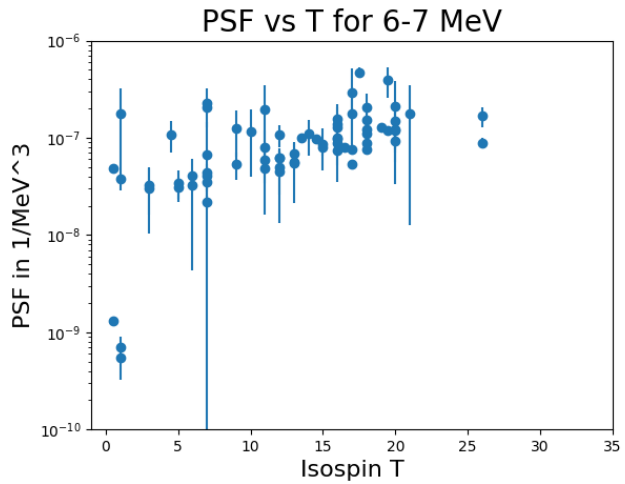


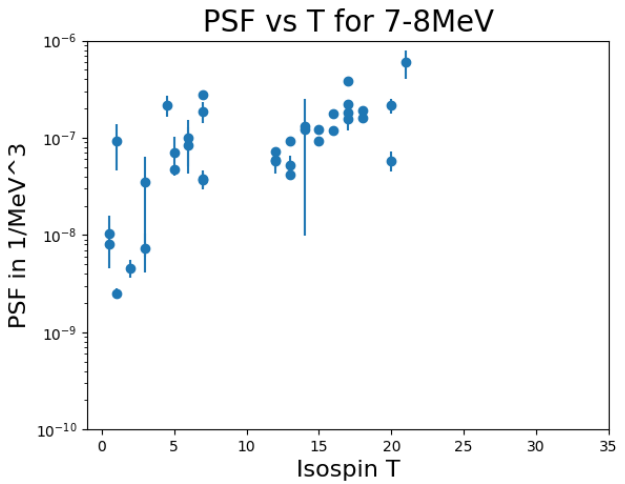
E1 PSF from ARC and DRC

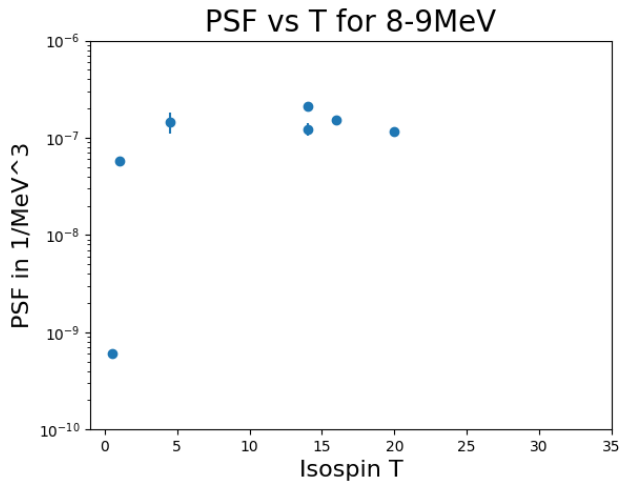




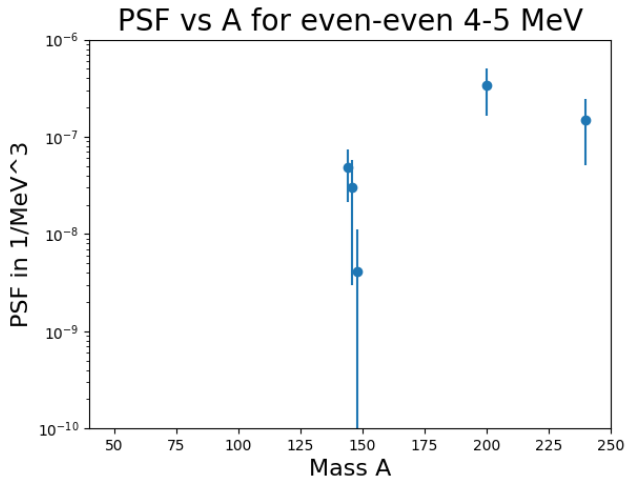


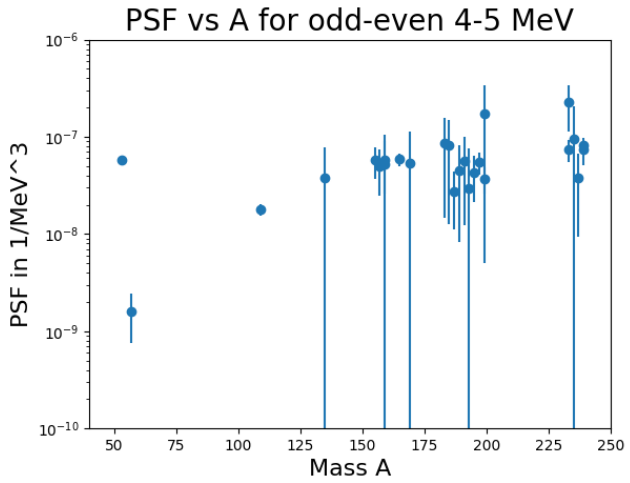


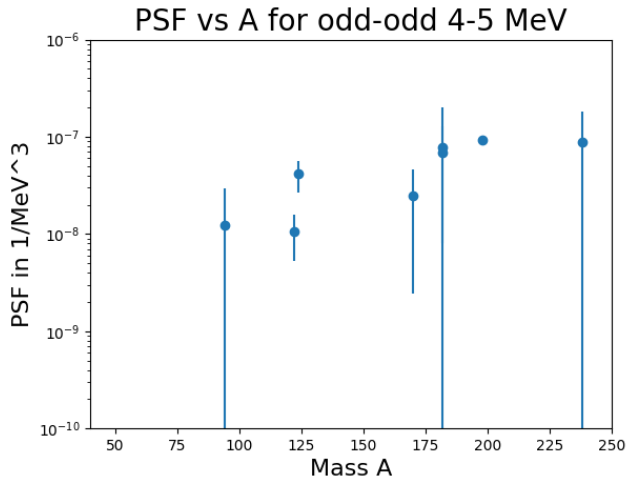


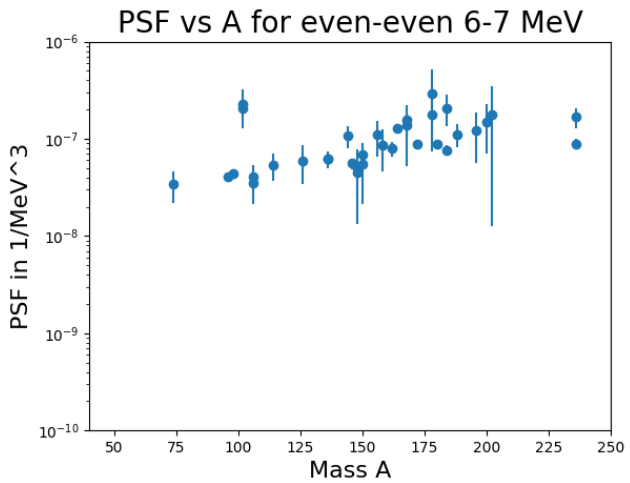


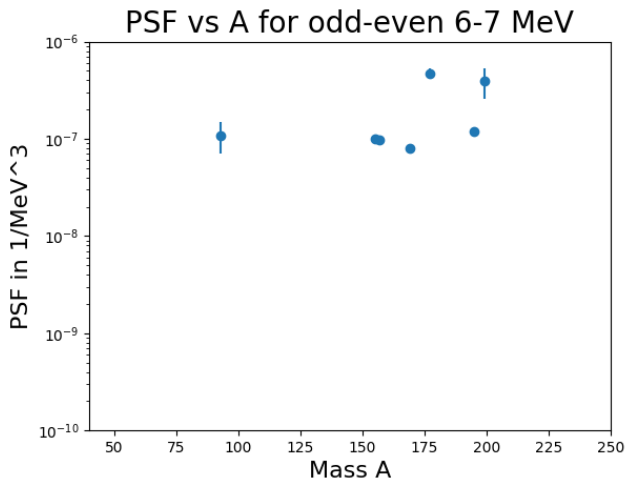
E1 PSF e-e, o-e, o-o from ARC and DRC

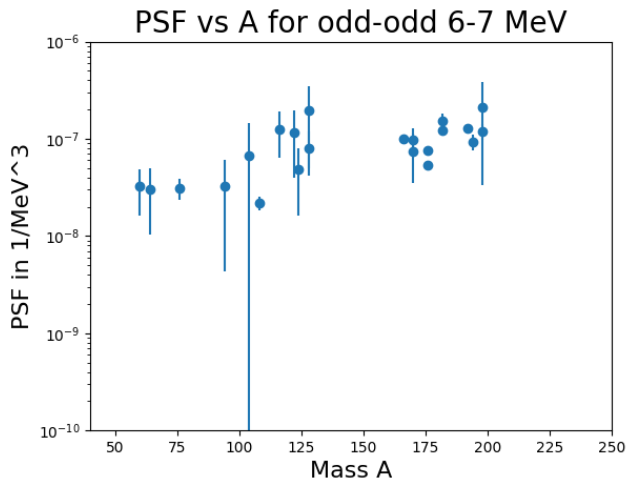




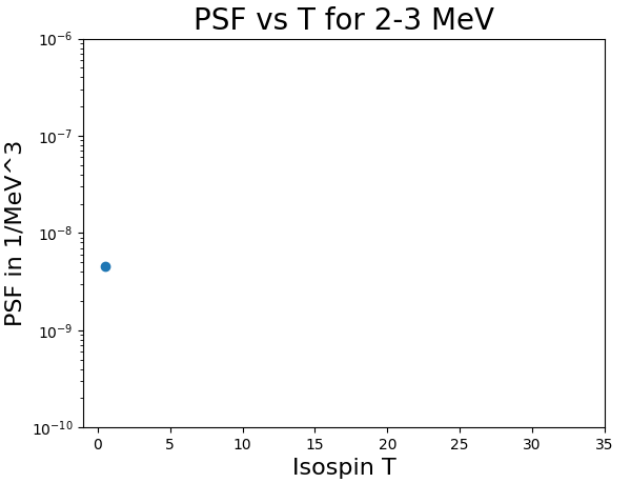


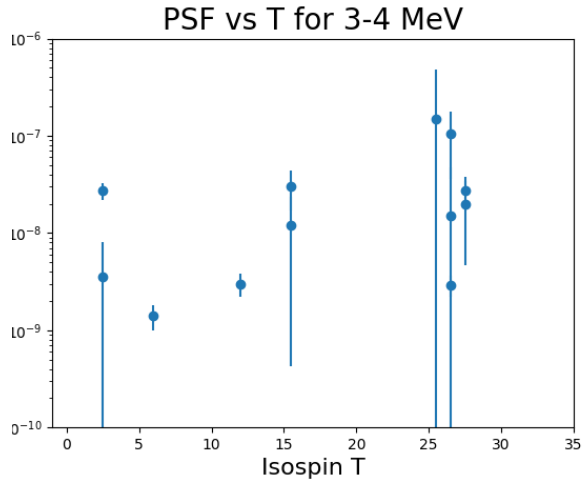


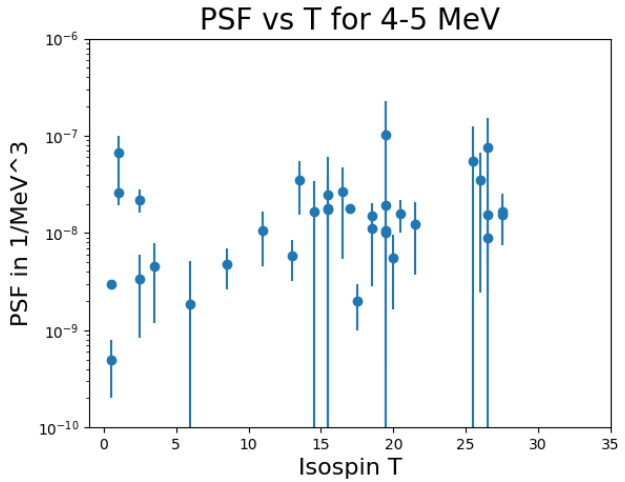


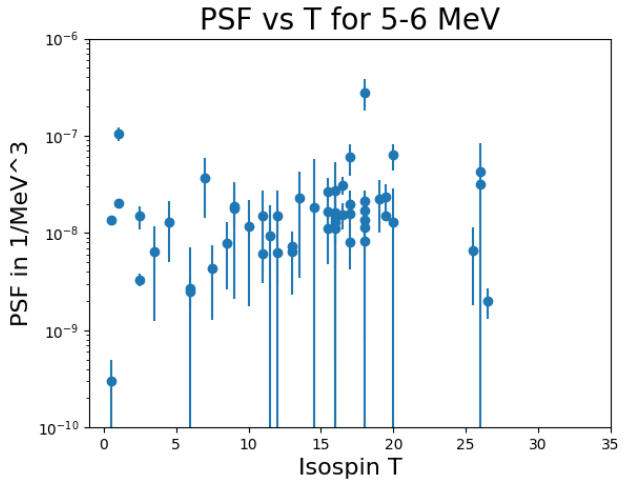


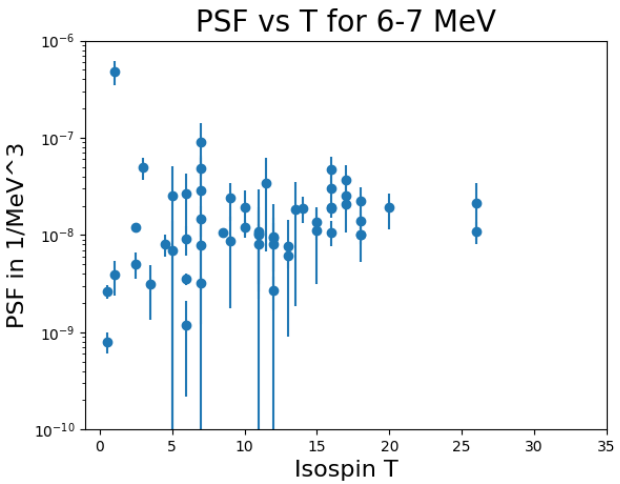
M1 PSF from ARC and DRC

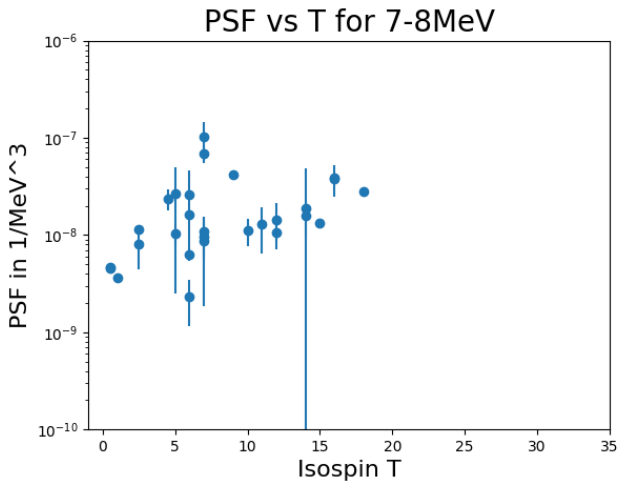


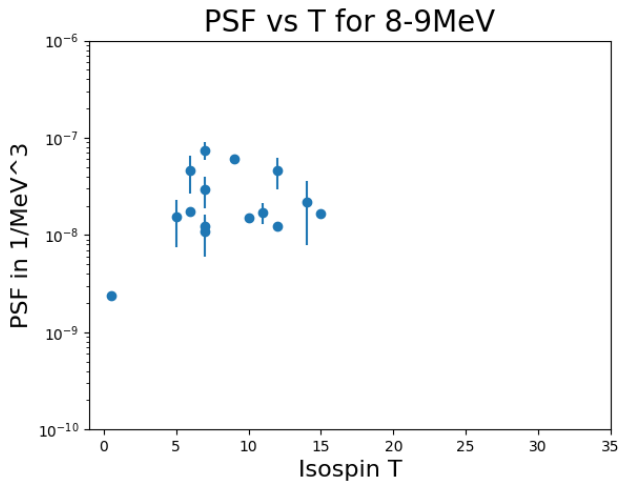


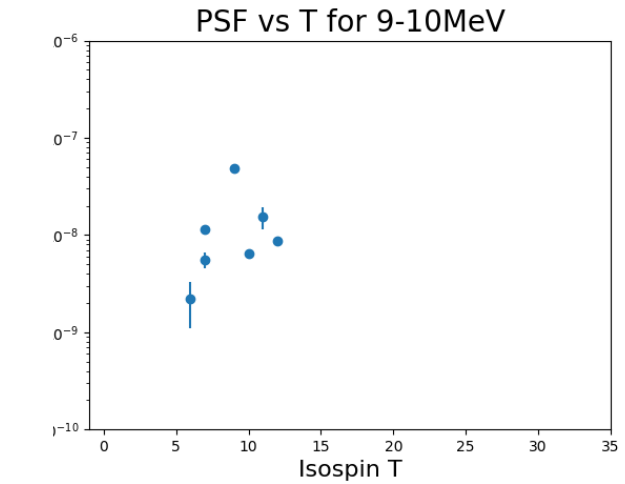




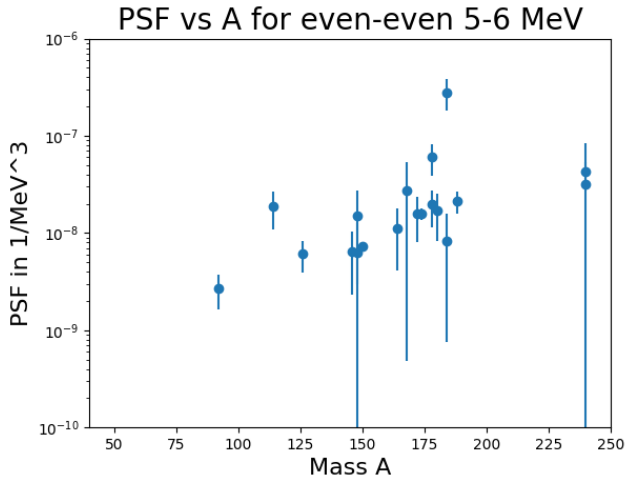


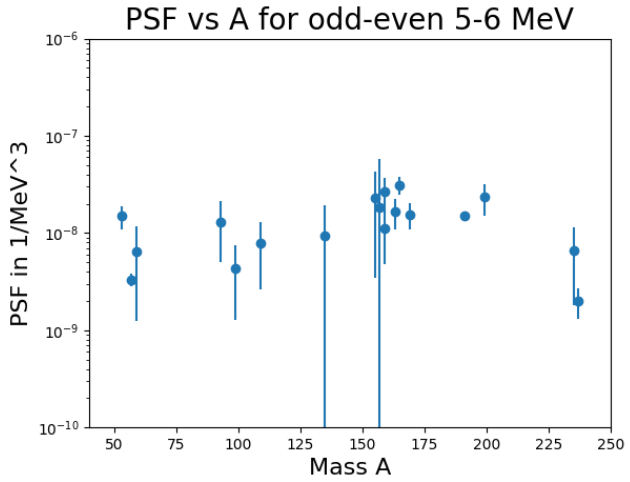


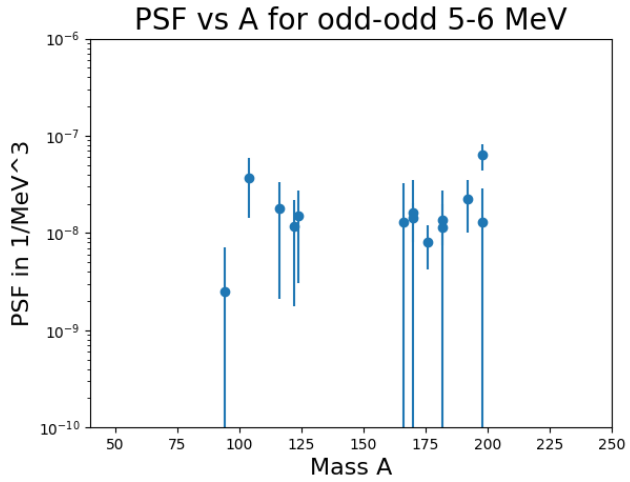


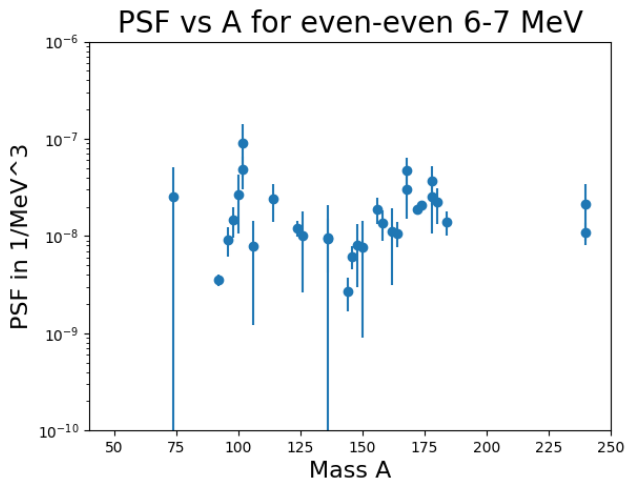


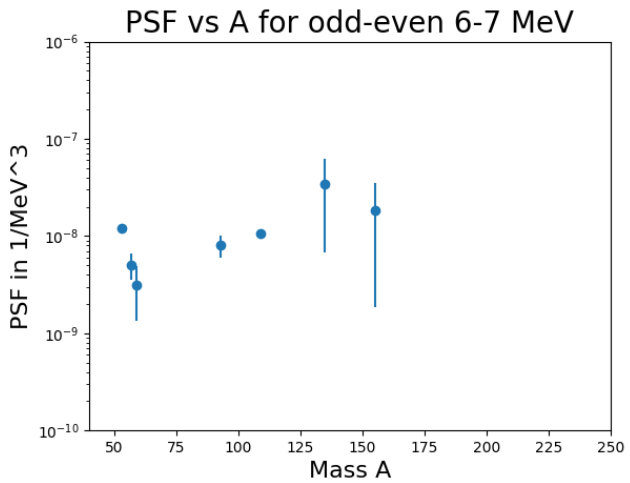
M1 PSF e-e, o-e, o-o from ARC and DRC

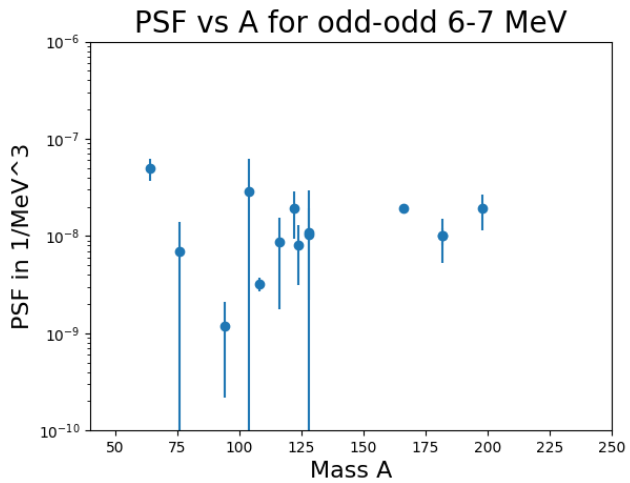




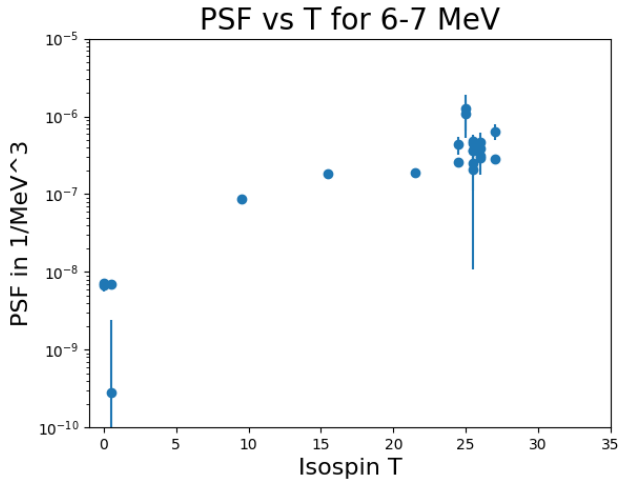


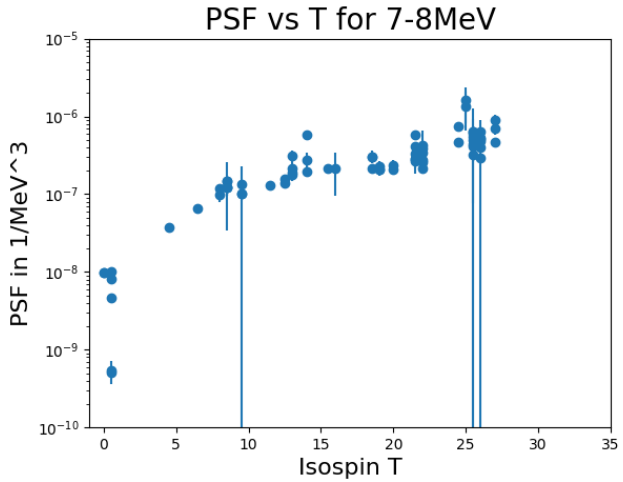


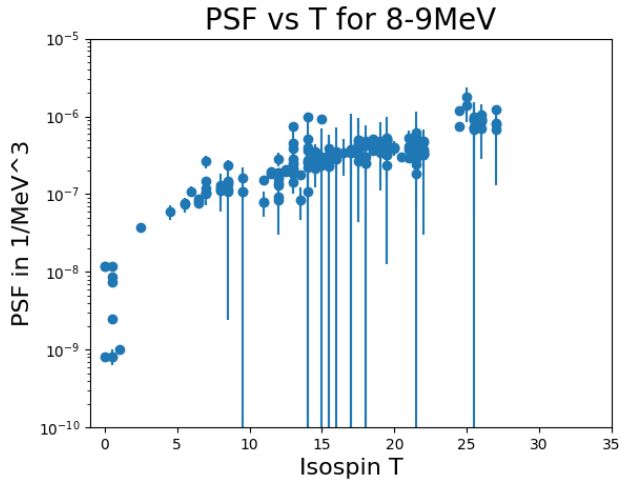


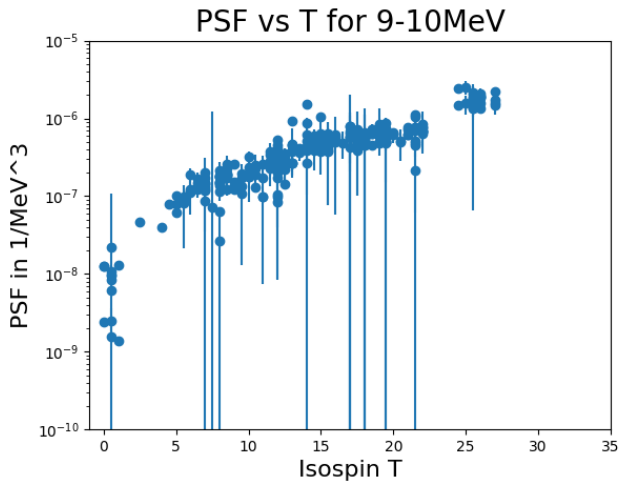


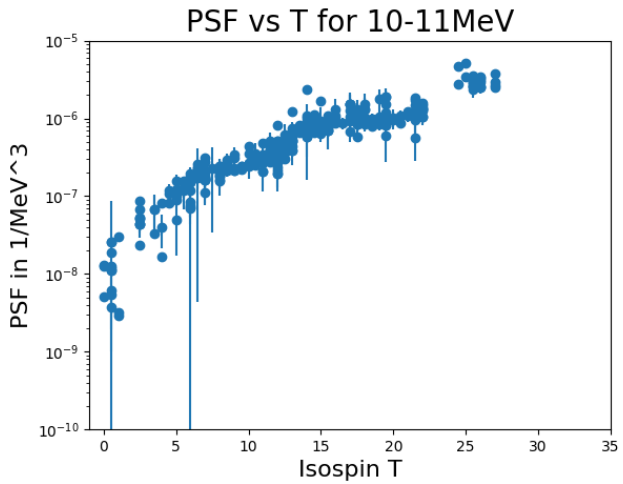
PSF from photonuclear

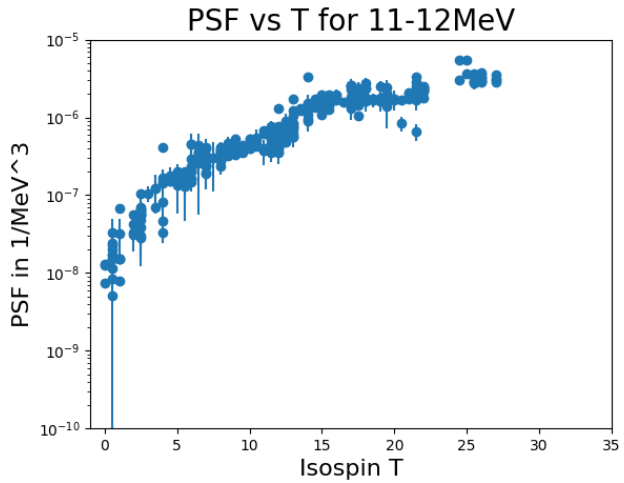












PSF e-e, o-e, o-o from photo-nuclear