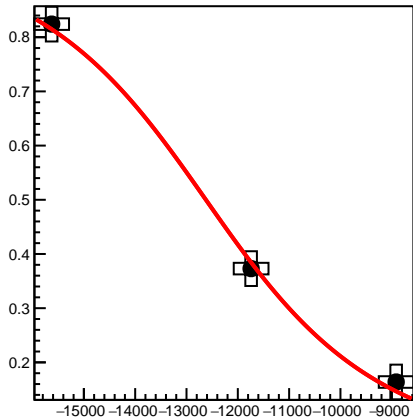
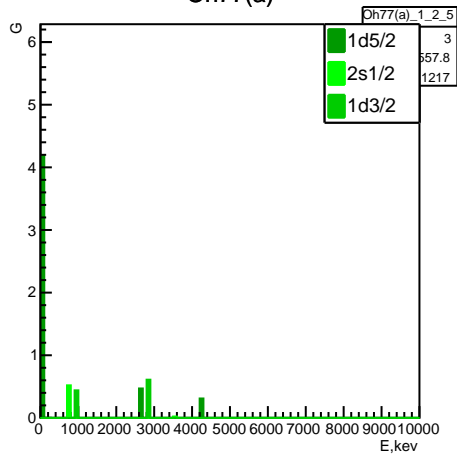
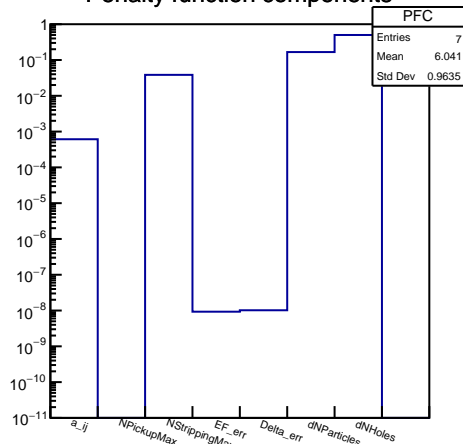


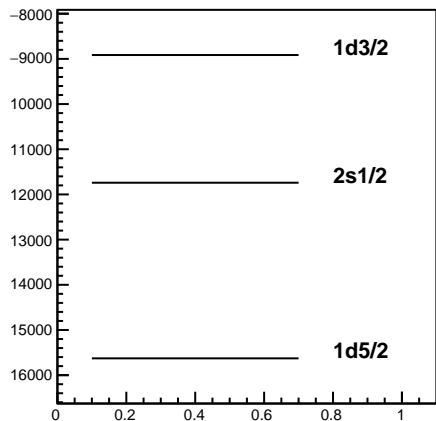
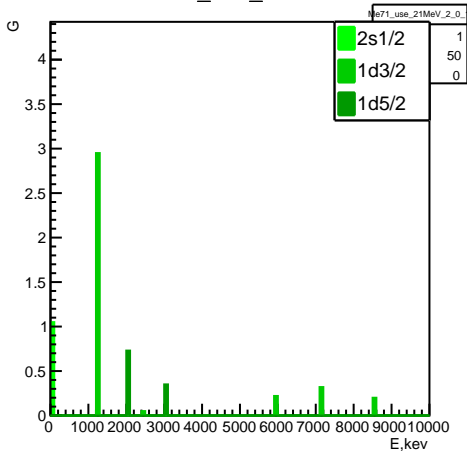
Oh77(a)



Penalty function components



Me71\_use\_21MeV



Experiment: Oh77(a) (7) Me71\_use\_21MeV (1)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12622.3  $\pm$  156.774 keV

$\Delta$ : 3709.93  $\pm$  309.5 keV

penalty: 0.135719

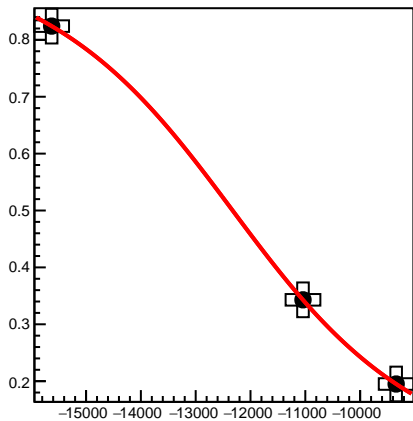
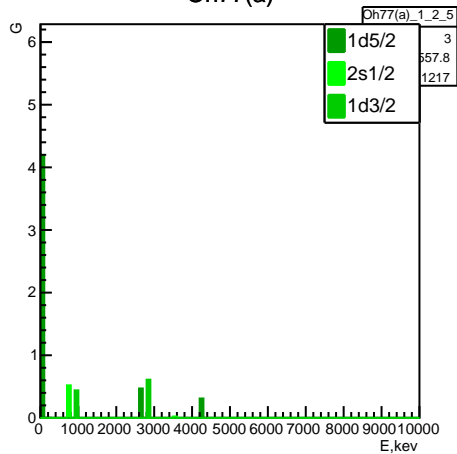
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15627.8 1d5/2 0.824167 1.00833

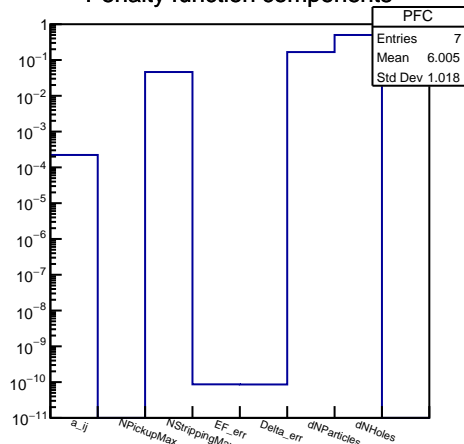
-11740.8 2s1/2 0.373 0.796

-8914.55 1d3/2 0.16375 1.1975

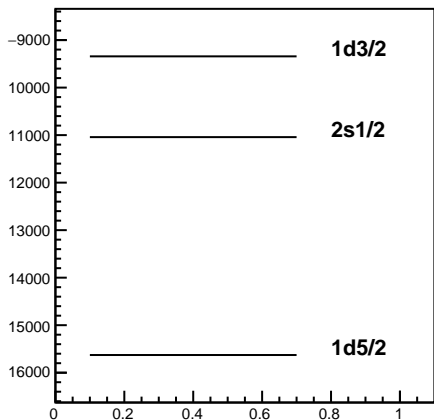
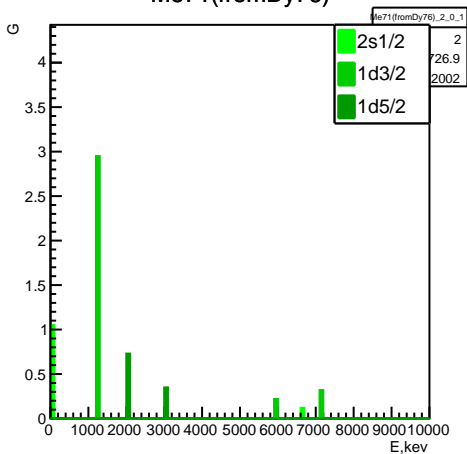
Oh77(a)



Penalty function components



Me71(fromDy76)



Experiment: Oh77(a) (7) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.8

 $E_F: -12326.1 \pm 1.46412 \text{ keV}$  $\Delta: 3876.67 \pm 2.61392 \text{ keV}$ 

penalty: 0.137124

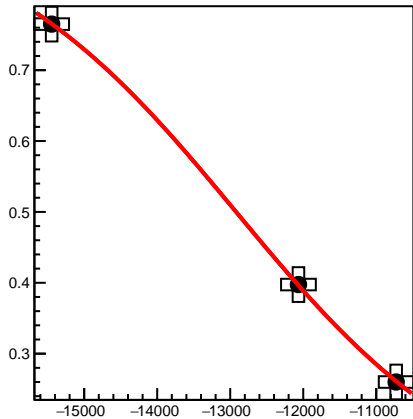
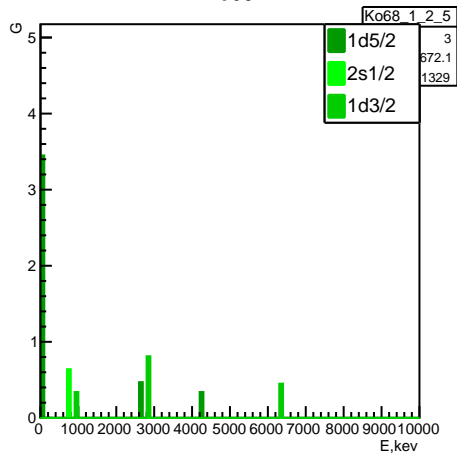
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15627.8 1d5/2 0.824167 1.00833

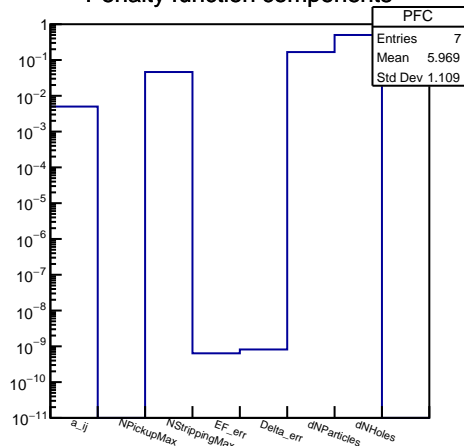
-11042.4 2s1/2 0.343 0.856

-9342.58 1d3/2 0.195 1.135

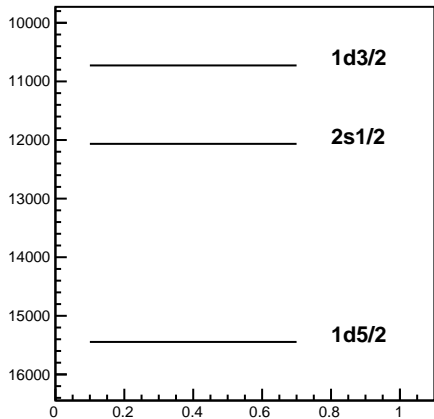
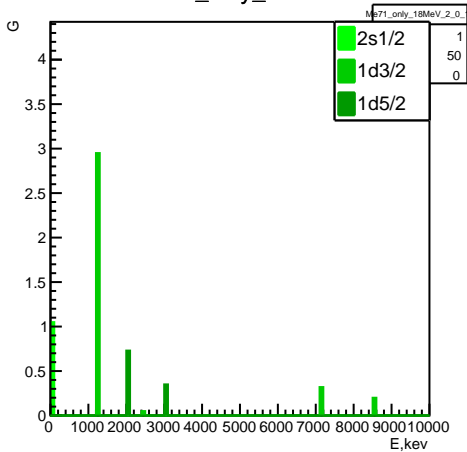
Ko68



Penalty function components



Me71\_only\_18MeV



Experiment: Ko68 (7) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12919.5 \pm 10.7704 \text{ keV}$  $\Delta: 4030.79 \pm 24.8337 \text{ keV}$ 

penalty: 0.138042

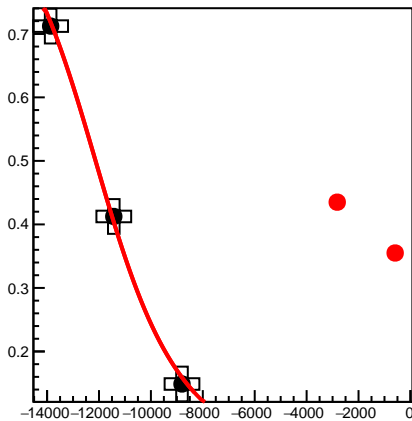
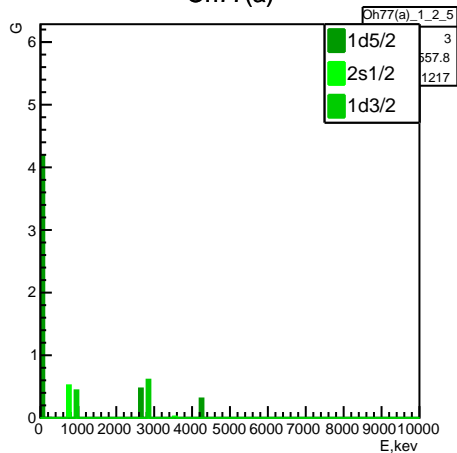
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15445.7 1d5/2 0.765 0.89

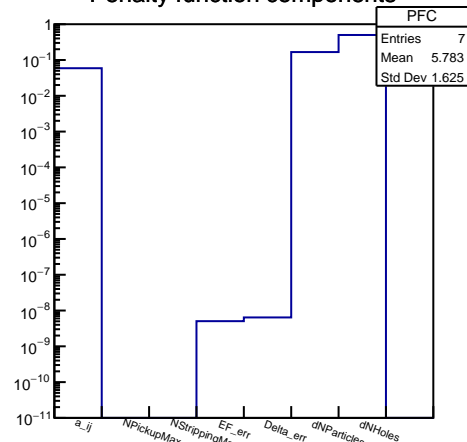
-12065.4 2s1/2 0.3975 0.845

-10727.3 1d3/2 0.26 1.28

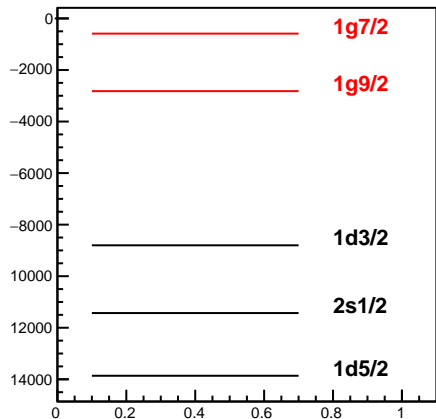
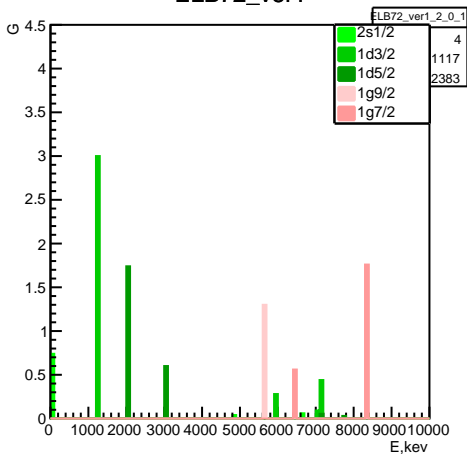
Oh77(a)



Penalty function components



ELB72\_ver1



Experiment: Oh77(a) (7) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12132.1 \pm 85.2499$  keV $\Delta$ :  $3572.85 \pm 195.042$  keV

penalty: 0.139541

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13862.8 1d5/2 0.712167 1.23233

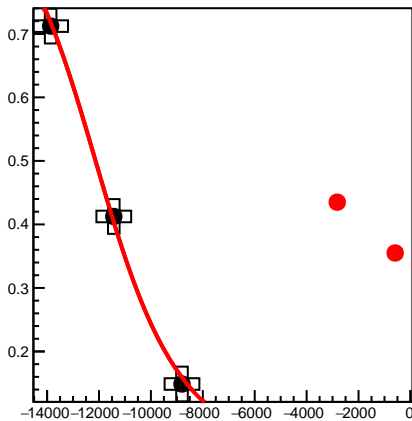
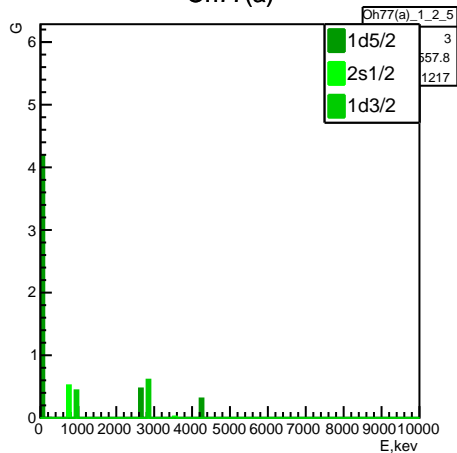
-11429.7 2s1/2 0.4125 0.717

-8801.97 1d3/2 0.14875 1.2275

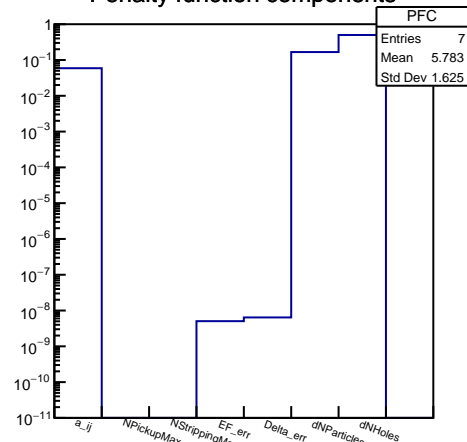
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

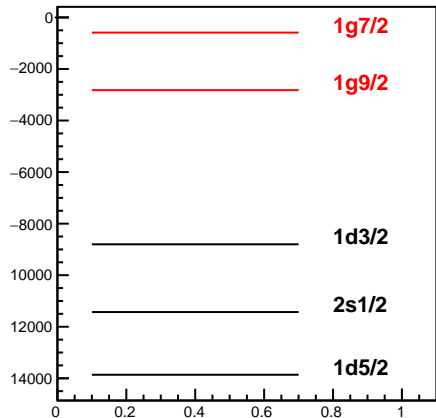
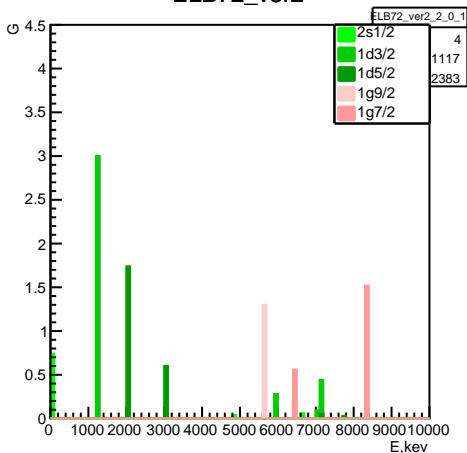
Oh77(a)



Penalty function components

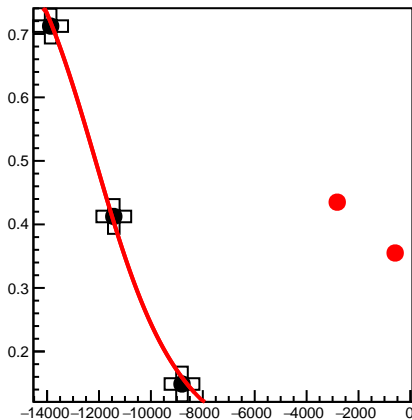
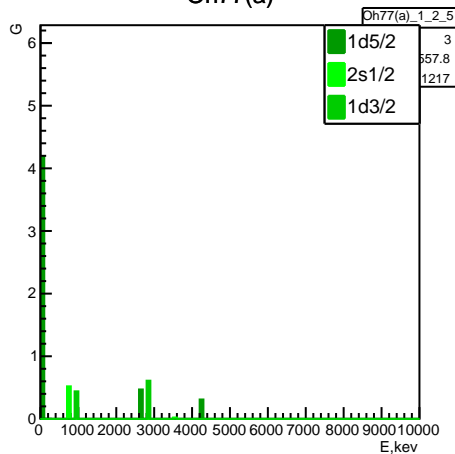


ELB72\_ver2

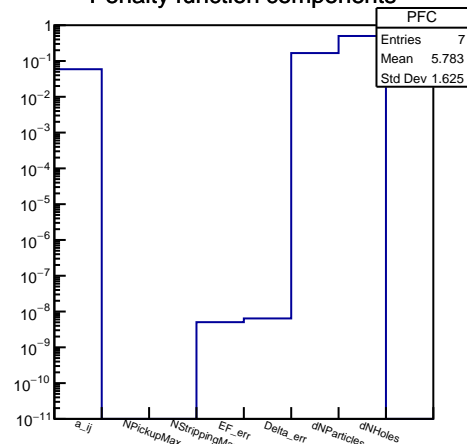


Experiment: Oh77(a) (7) ELB72\_ver2 (16)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F$ :  $-12132.1 \pm 85.2499$  keV  
 $\Delta$ :  $3572.85 \pm 195.042$  keV  
 penalty: 0.139541  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -13862.8 1d5/2 0.712167 1.23233  
 -11429.7 2s1/2 0.4125 0.717  
 -8801.97 1d3/2 0.14875 1.2275  
 -2820.87 1g9/2 0.435 5.58294e-322  
 -588.767 1g7/2 0.355 6.92655e-310

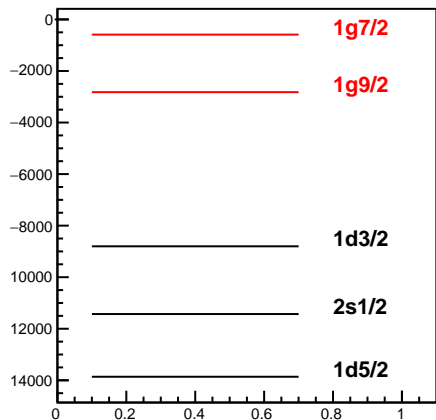
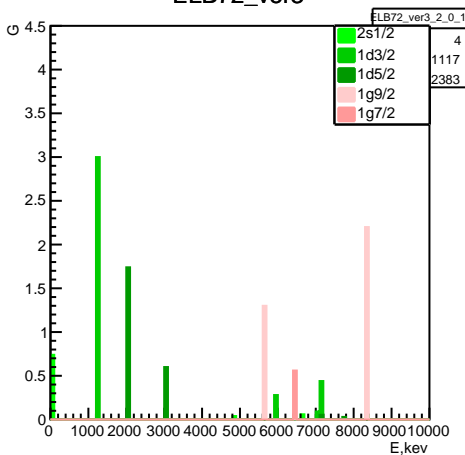
Oh77(a)



Penalty function components

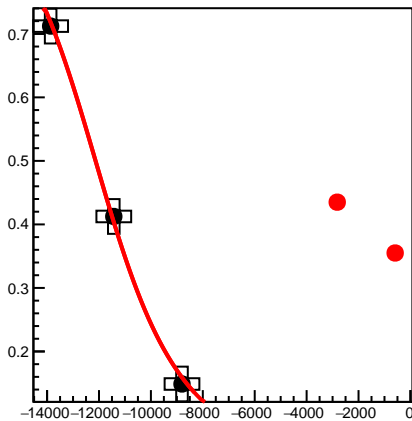
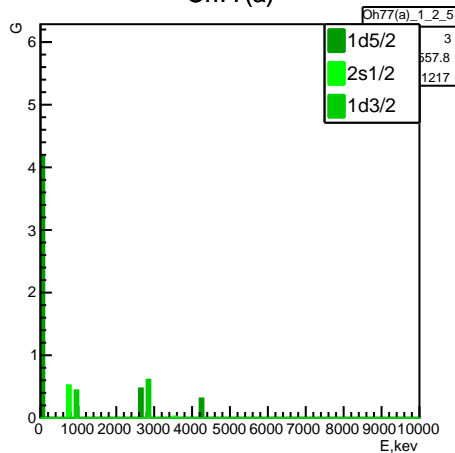


ELB72\_ver3

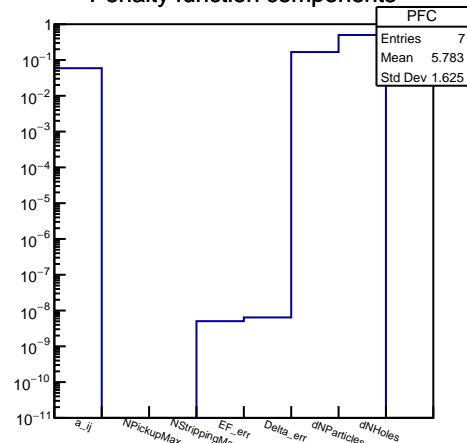


Experiment: Oh77(a) (7) ELB72\_ver3 (16)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F$ :  $-12132.1 \pm 85.2499$  keV  
 $\Delta$ :  $3572.85 \pm 195.042$  keV  
 penalty: 0.139541  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -13862.8 1d5/2 0.712167 1.23233  
 -11429.7 2s1/2 0.4125 0.717  
 -8801.97 1d3/2 0.14875 1.2275  
 -2820.87 1g9/2 0.435 5.26354e-315  
 -588.767 1g7/2 0.355 2.37152e-322

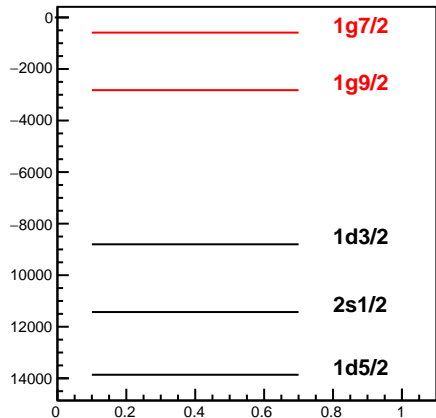
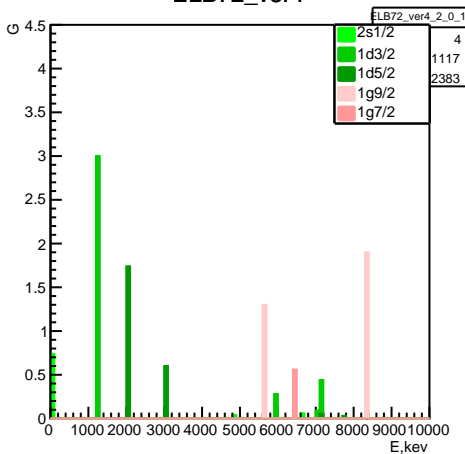
Oh77(a)



Penalty function components



ELB72\_ver4



Experiment: Oh77(a) (7) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12132.1 \pm 85.2499$  keV $\Delta$ :  $3572.85 \pm 195.042$  keV

penalty: 0.139541

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13862.8 1d5/2 0.712167 1.23233

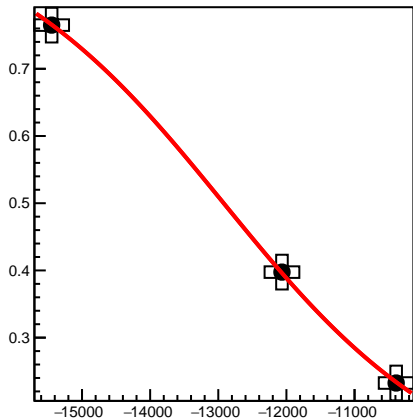
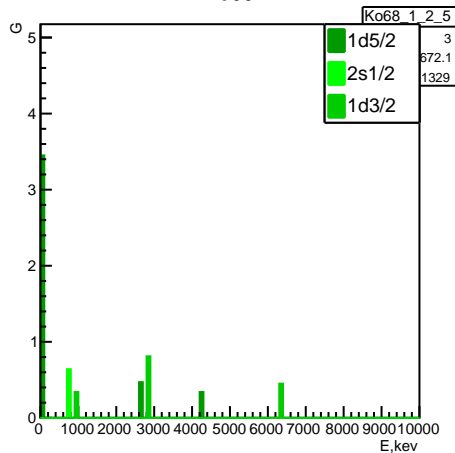
-11429.7 2s1/2 0.4125 0.717

-8801.97 1d3/2 0.14875 1.2275

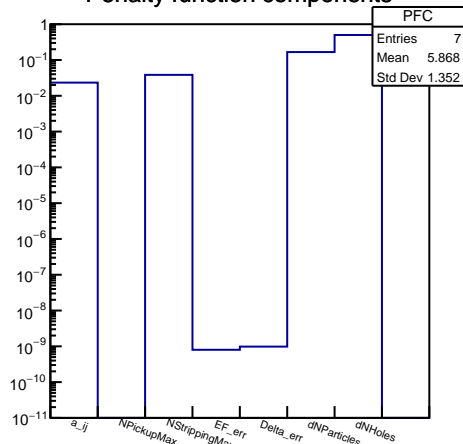
-2820.87 1g9/2 0.435 1.2732e-313

-588.767 1g7/2 0.355 2.37152e-322

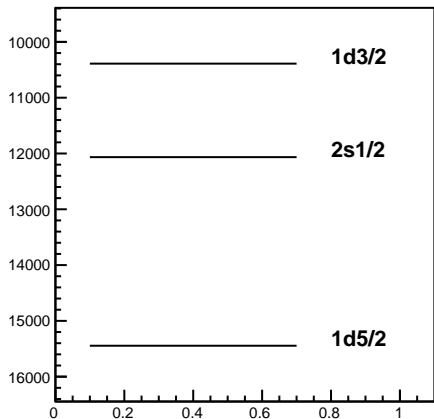
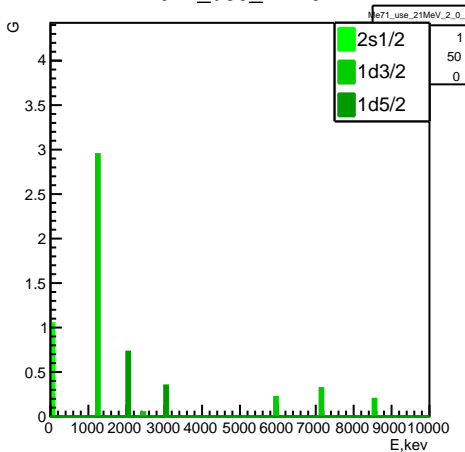
Ko68



Penalty function components



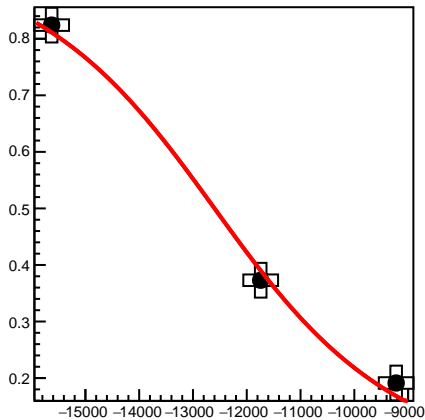
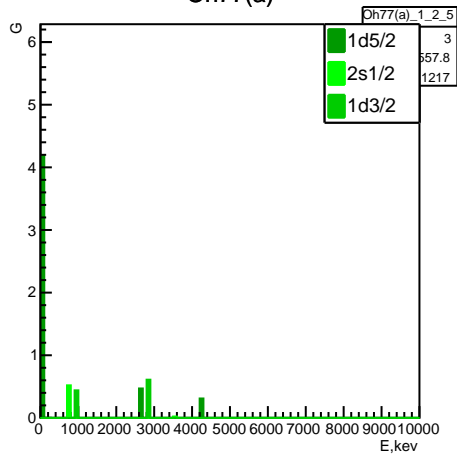
Me71\_use\_21MeV



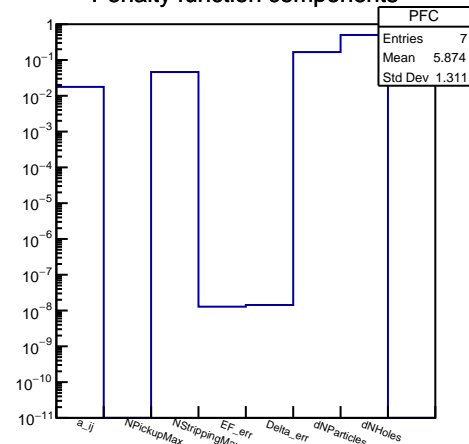
Experiment: Ko68 (7) Me71\_use\_21MeV (8)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.8  
 $E_F$ : -12920.5  $\pm$  13.5182 keV  
 $\Delta$ : -4025.94  $\pm$  29.8511 keV  
 penalty: 0.140089  
 $SPE, keV \ nlj \ OCC \ \frac{G^+ + G^-}{2J+1}$   
 -15445.7 1d5/2 0.765 0.89  
 -12065.4 2s1/2 0.3975 0.845  
 -10389.4 1d3/2 0.2325 1.335



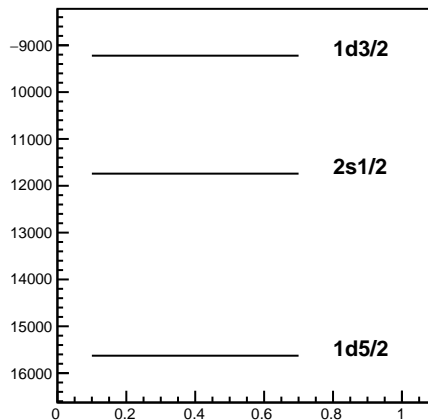
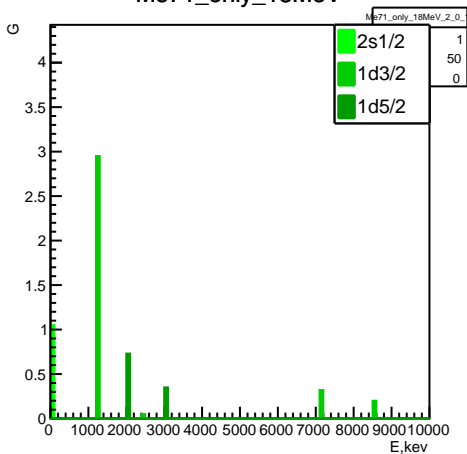
Oh77(a)



Penalty function components



Me71\_only\_18MeV



Experiment: Oh77(a) (7) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12599.2 ± 216.444 keV

Δ: 3809.02 ± 434.366 keV

penalty: 0.140489

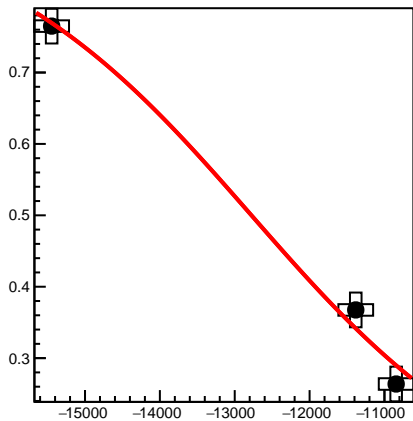
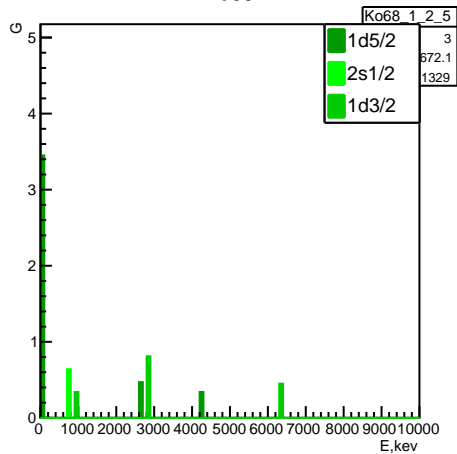
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15627.8 1d5/2 0.824167 1.00833

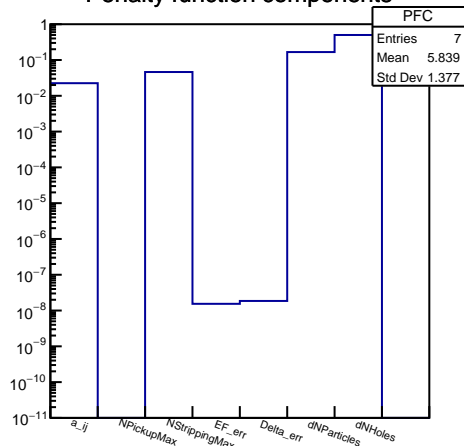
-11740.8 2s1/2 0.373 0.796

-9222.1 1d3/2 0.19125 1.1425

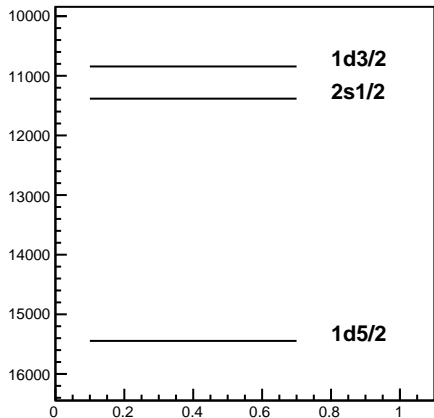
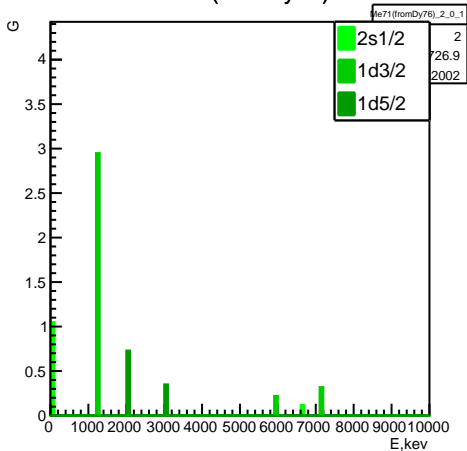
Ko68



Penalty function components



Me71(fromDy76)



Experiment: Ko68 (7) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12776.7  $\pm$  260.068 keV $\Delta$ : 4172.4  $\pm$  563.501 keV

penalty: 0.141408

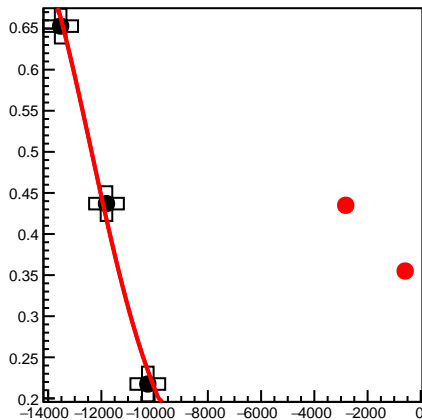
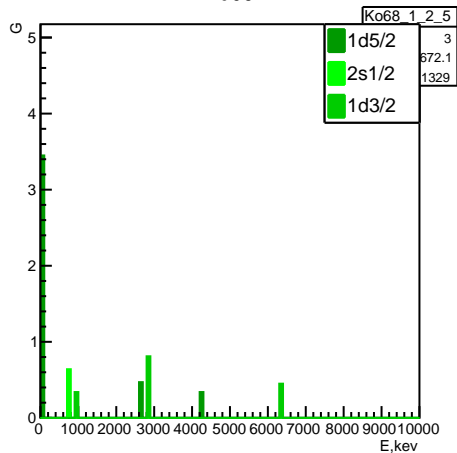
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15445.7 1d5/2 0.765 0.89

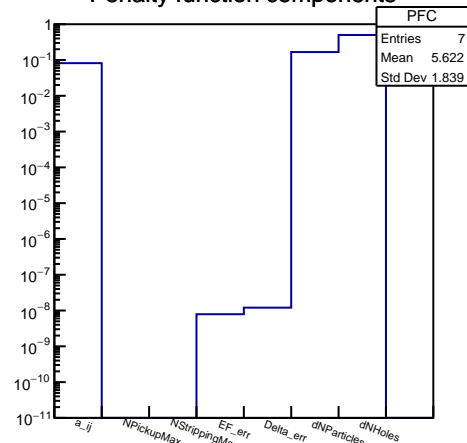
-11383.3 2s1/2 0.3675 0.905

-10843.6 1d3/2 0.26375 1.2725

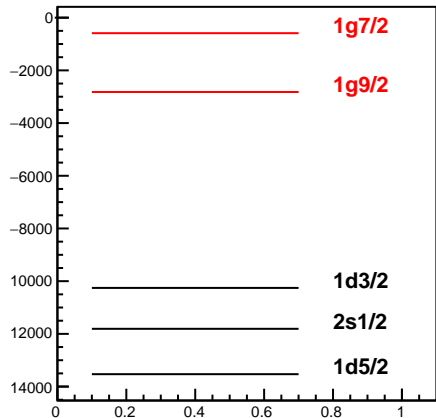
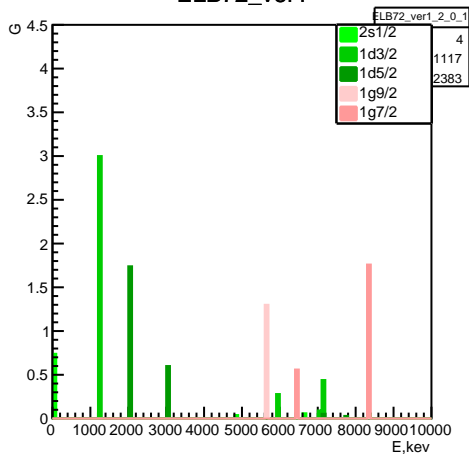
Ko68



Penalty function components



ELB72\_ver1



Experiment: Ko68 (7) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12367.4 \pm 133.179$  keV $\Delta: 3360.08 \pm 366.161$  keV

penalty: 0.14391

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13529.8 1d5/2 0.653 1.114

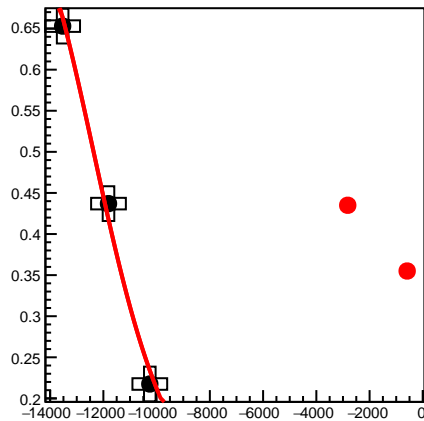
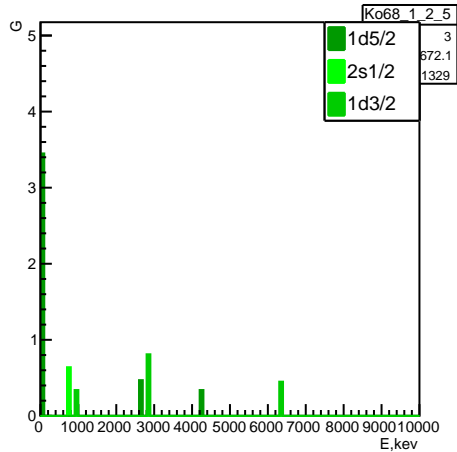
-11807.8 2s1/2 0.437 0.766

-10255.8 1d3/2 0.2175 1.365

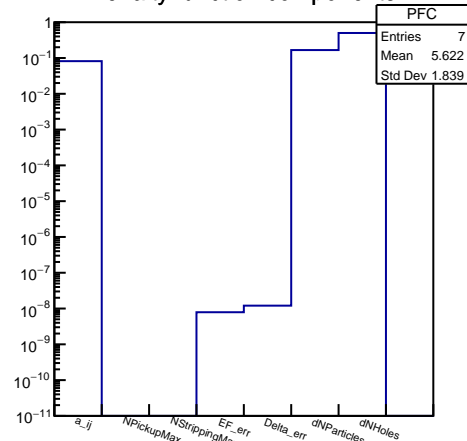
-2820.87 1g9/2 0.435 8.74496e-322

-588.767 1g7/2 0.355 0.5

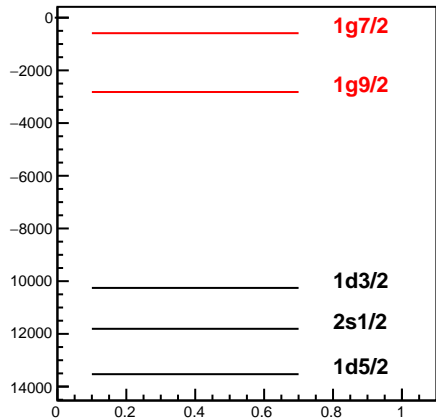
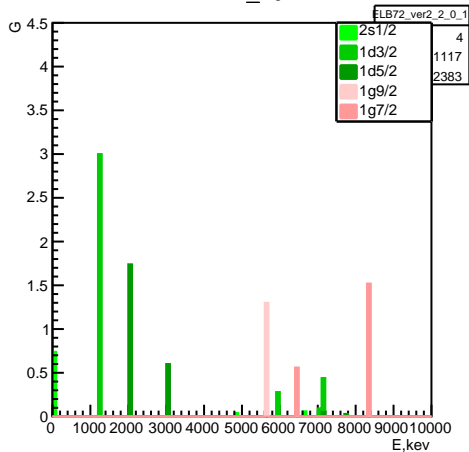
Ko68



Penalty function components



ELB72\_ver2



Experiment: Ko68 (7) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12367.4 \pm 133.179$  keV $\Delta: 3360.08 \pm 366.161$  keV

penalty: 0.14391

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13529.8 1d5/2 0.653 1.114

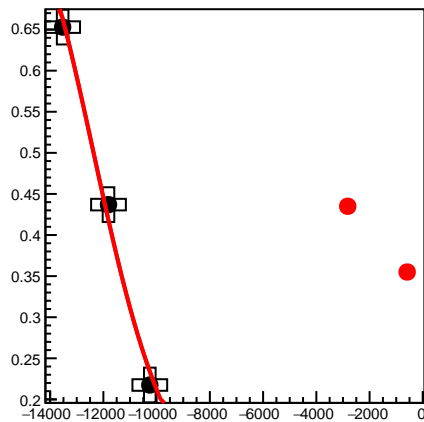
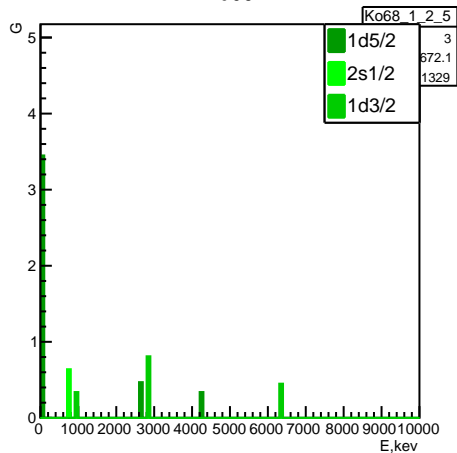
-11807.8 2s1/2 0.437 0.766

-10255.8 1d3/2 0.2175 1.365

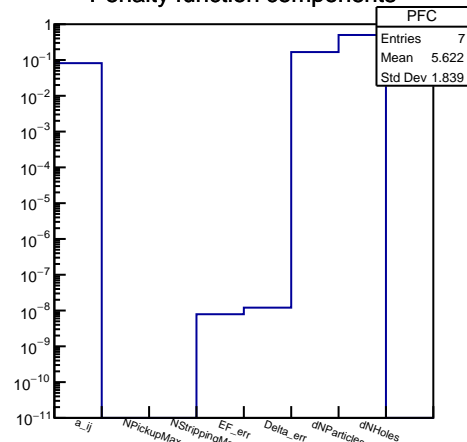
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0816667

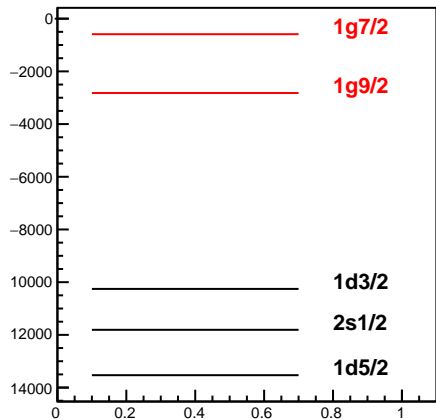
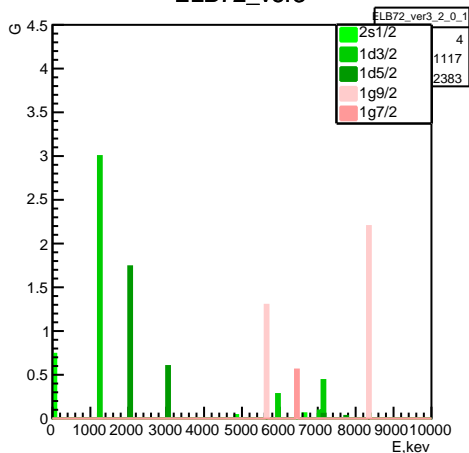
Ko68



Penalty function components



ELB72\_ver3



Experiment: Ko68 (7) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12367.4 \pm 133.179$  keV $\Delta: 3360.08 \pm 366.161$  keV

penalty: 0.14391

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13529.8 1d5/2 0.653 1.114

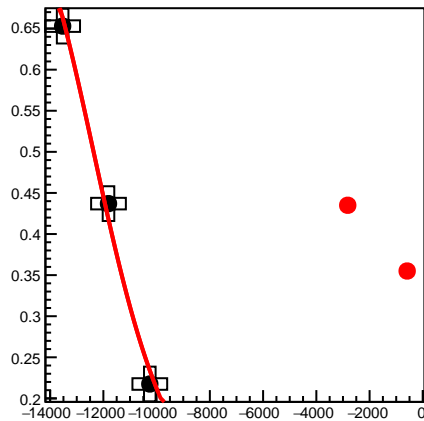
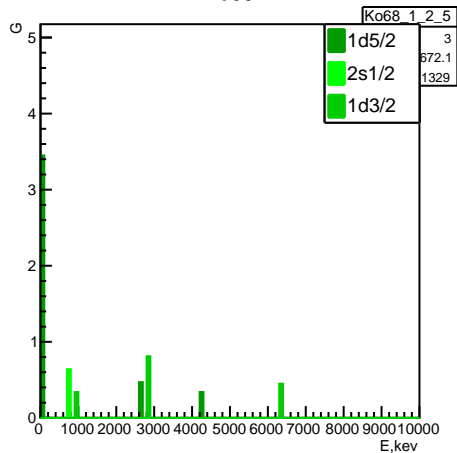
-11807.8 2s1/2 0.437 0.766

-10255.8 1d3/2 0.2175 1.365

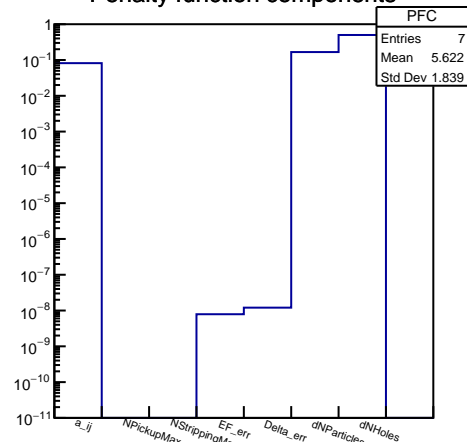
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

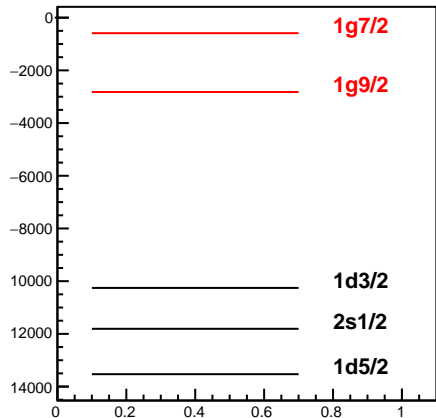
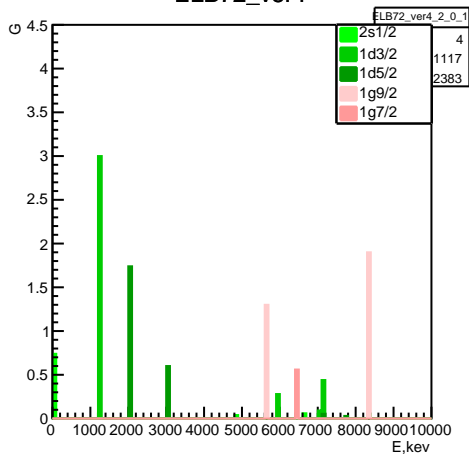
Ko68



Penalty function components



ELB72\_ver4



Experiment: Ko68 (7) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12367.4 ± 133.179 keV

Δ: 3360.08 ± 366.161 keV

penalty: 0.14391

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13529.8 1d5/2 0.653 1.114

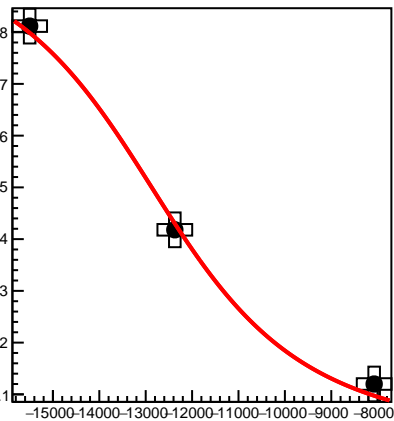
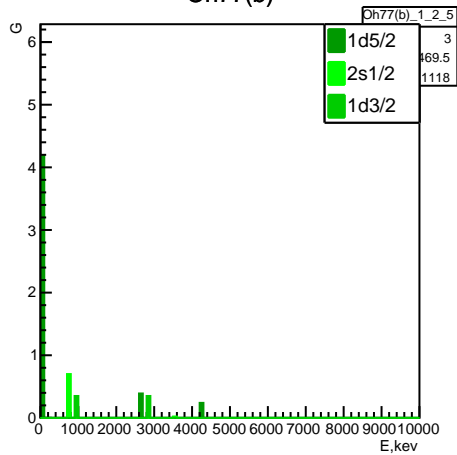
-11807.8 2s1/2 0.437 0.766

-10255.8 1d3/2 0.2175 1.365

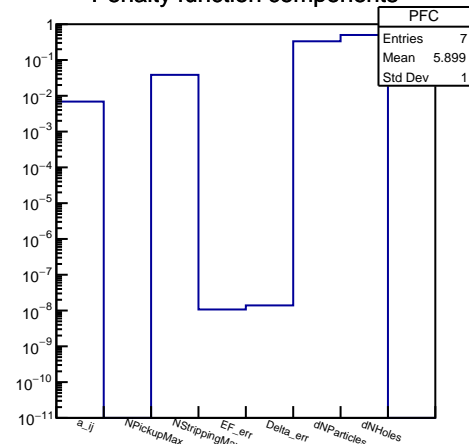
-2820.87 1g9/2 0.435 1.2732e-313

-588.767 1g7/2 0.355 2.37152e-322

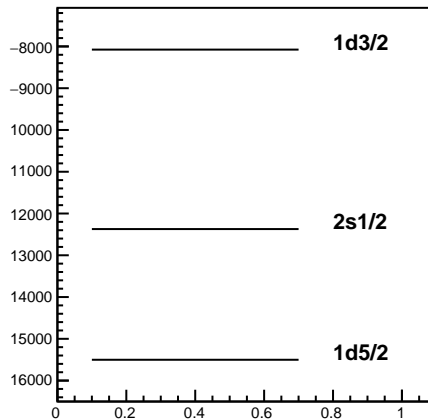
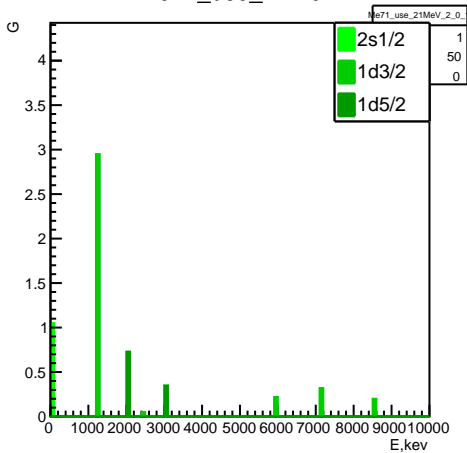
Oh77(b)



Penalty function components



Me71\_use\_21MeV



Experiment: Oh77(b) (7) Me71\_use\_21MeV (

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12870.6 ± 180.729 keV

Δ: 3531.33 ± 422.852 keV

penalty: 0.168978

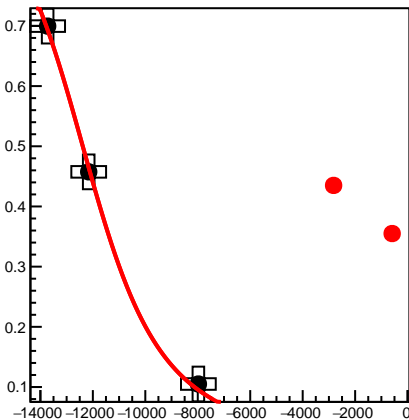
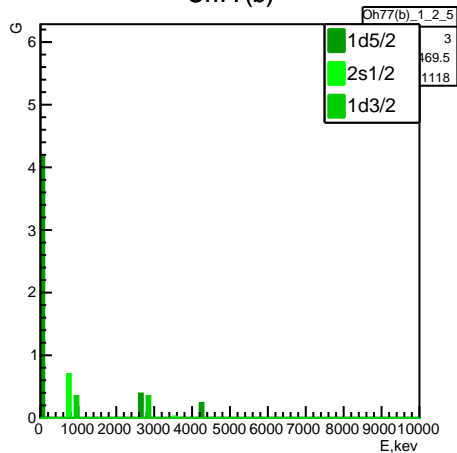
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15501.6 1d5/2 0.811667 0.983333

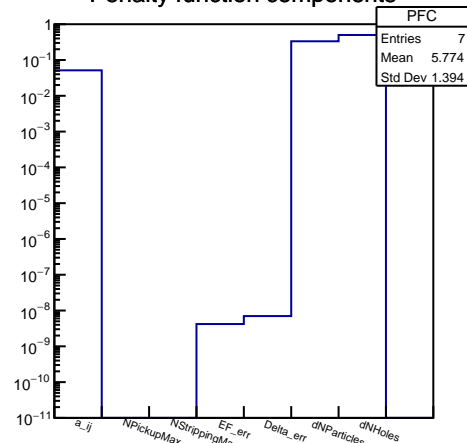
-12372.5 2s1/2 0.418 0.886

-8075.85 1d3/2 0.12 1.11

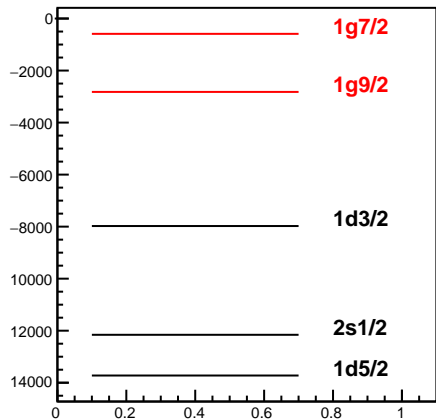
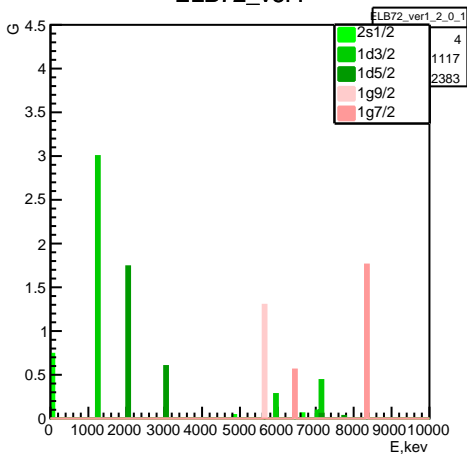
Oh77(b)



Penalty function components



ELB72\_ver1



Experiment: Oh77(b) (7) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12384.5 ± 70.8323 keV

Δ: -3193.49 ± 212.904 keV

penalty: 0.17015

SPE, keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13723.4 1d5/2 0.699667 1.20733

-12157.9 2s1/2 0.4575 0.807

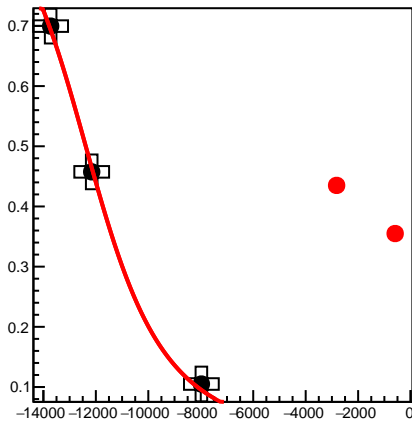
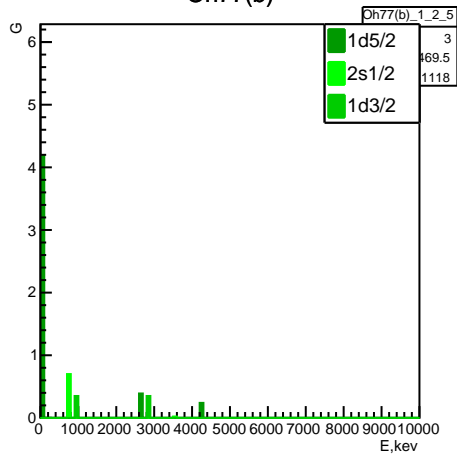
-7976.7 1d3/2 0.105 1.14

-2820.87 1g9/2 0.435 1.2732e-313

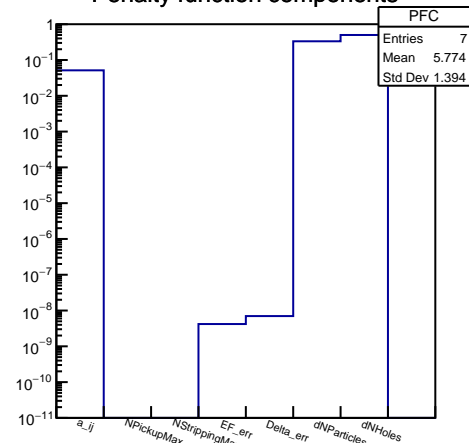
-588.767 1g7/2 0.355 2.37152e-322



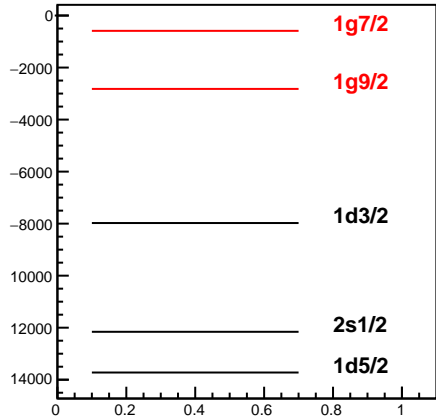
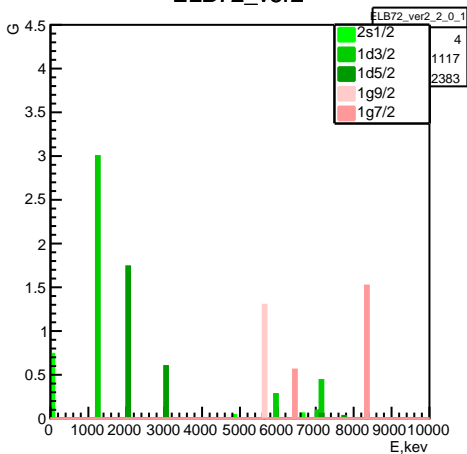
Oh77(b)



Penalty function components



ELB72\_ver2



Experiment: Oh77(b) (7) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12384.5 \pm 70.8323$  keV $\Delta$ :  $-3193.49 \pm 212.904$  keV

penalty: 0.17015

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13723.4 1d5/2 0.699667 1.20733

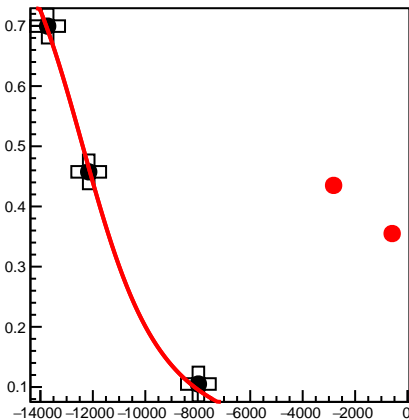
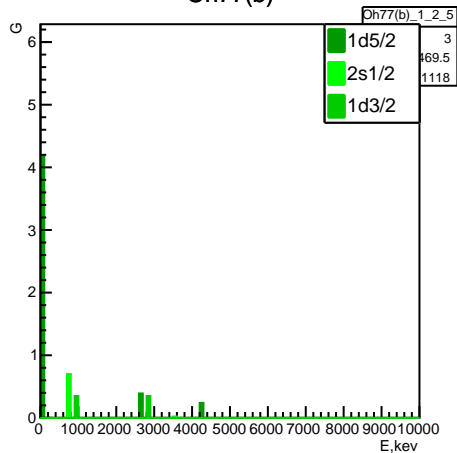
-12157.9 2s1/2 0.4575 0.807

-7976.7 1d3/2 0.105 1.14

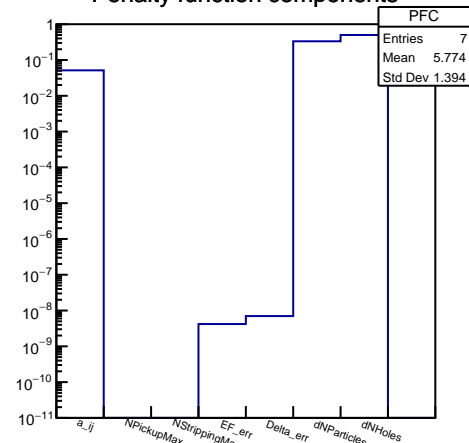
-2820.87 1g9/2 0.435 1.2732e-313

-588.767 1g7/2 0.355 2.37152e-322

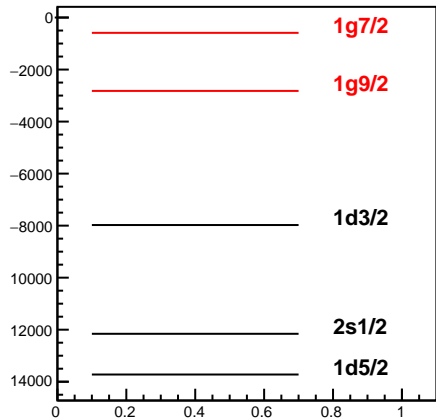
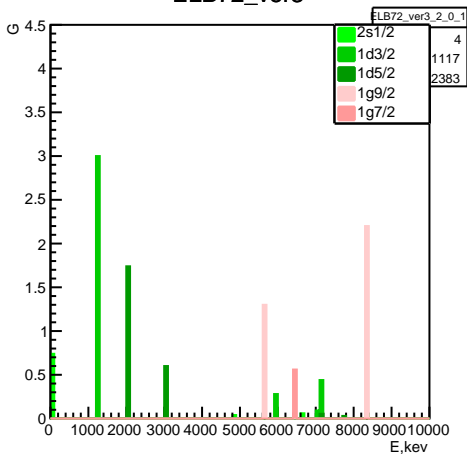
Oh77(b)



Penalty function components



ELB72\_ver3



Experiment: Oh77(b) (7) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12384.5 ± 70.8323 keV

Δ: -3193.49 ± 212.904 keV

penalty: 0.17015

SPE, keV nIj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13723.4 1d5/2 0.699667 1.20733

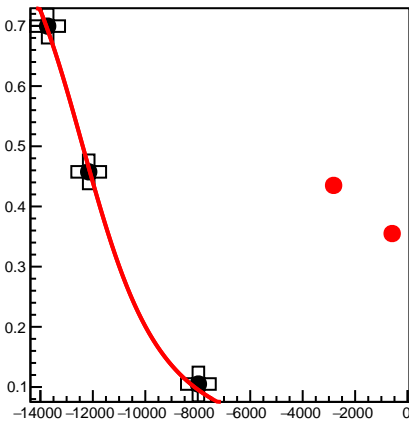
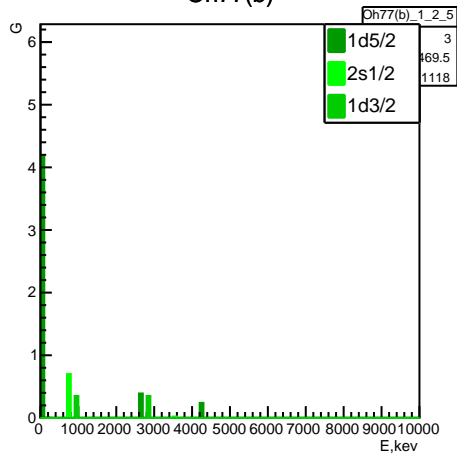
-12157.9 2s1/2 0.4575 0.807

-7976.7 1d3/2 0.105 1.14

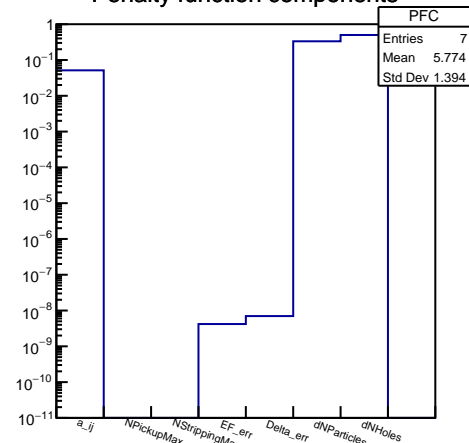
-2820.87 1g9/2 0.435 4.68096e-310

-588.767 1g7/2 0.355 2.37152e-322

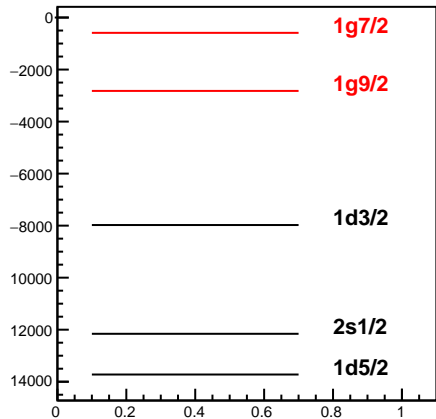
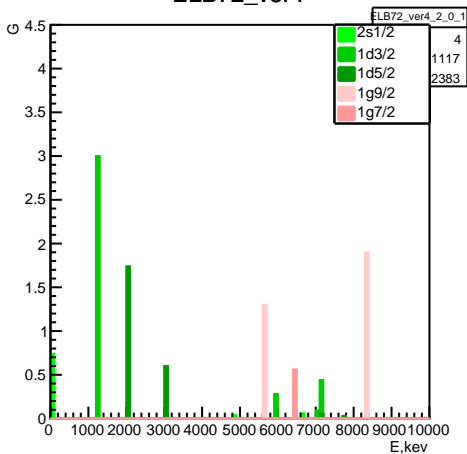
Oh77(b)



Penalty function components



ELB72\_ver4



Experiment: Oh77(b) (7) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.8

 $E_F$ :  $-12384.5 \pm 70.8323$  keV $\Delta$ :  $-3193.49 \pm 212.904$  keV

penalty: 0.17015

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13723.4 1d5/2 0.699667 1.20733

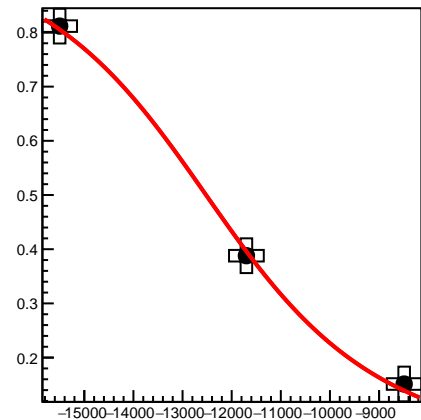
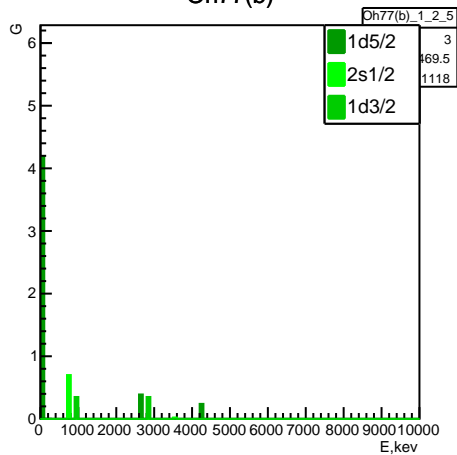
-12157.9 2s1/2 0.4575 0.807

-7976.7 1d3/2 0.105 1.14

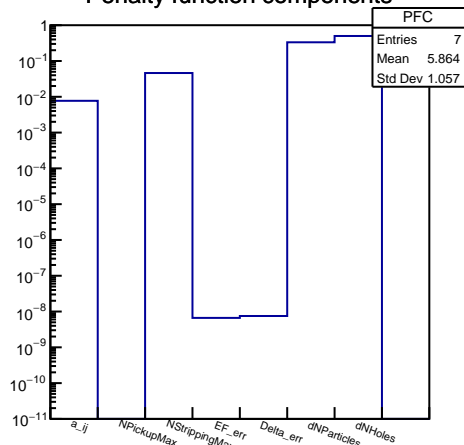
-2820.87 1g9/2 0.435 8.74496e-322

-588.767 1g7/2 0.355 0.5

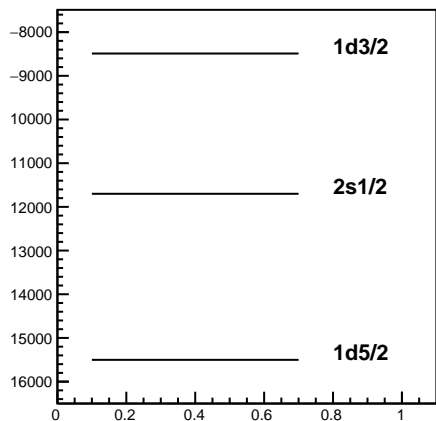
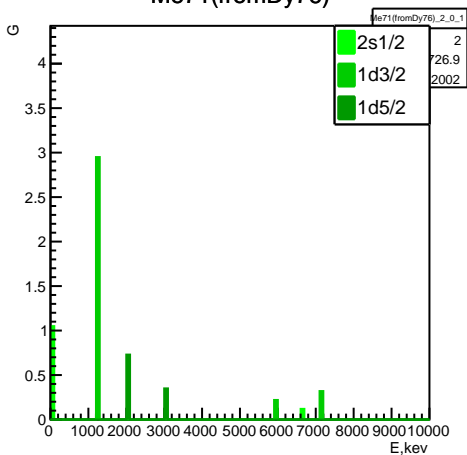
Oh77(b)



Penalty function components



Me71(fromDy76)



Experiment: Oh77(b) (7) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12521.4 ± 112.154 keV

Δ: 3864.17 ± 228.227 keV

penalty: 0.170617

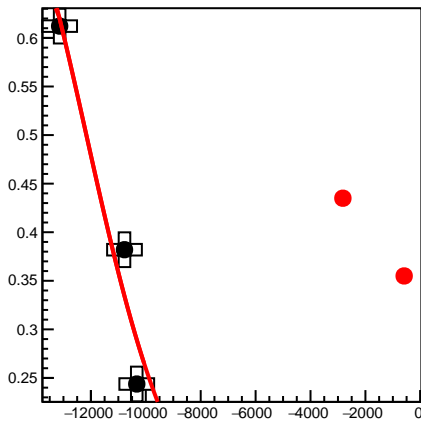
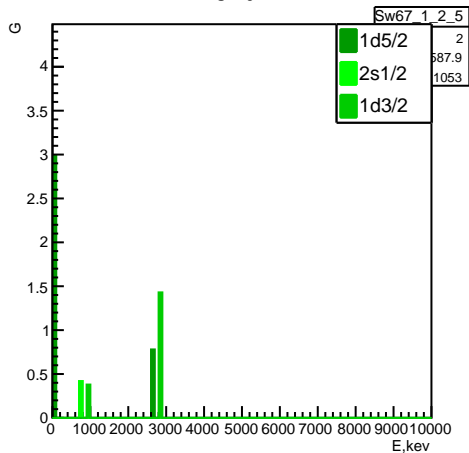
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15501.6 1d5/2 0.811667 0.983333

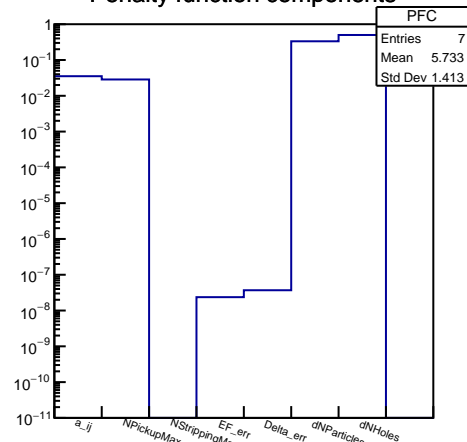
-11700.4 2s1/2 0.388 0.946

-8489.6 1d3/2 0.15125 1.0475

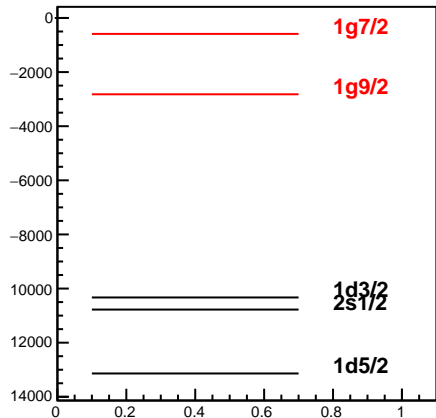
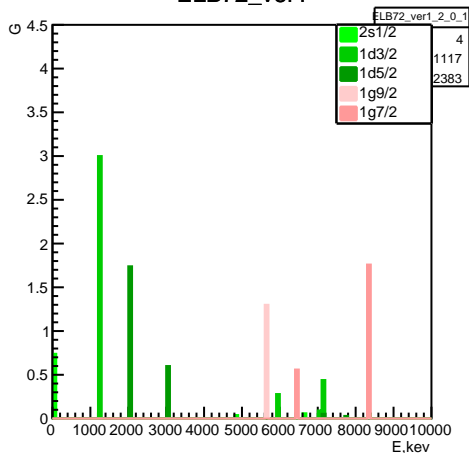
Sw67



Penalty function components



ELB72\_ver1



Experiment: Sw67 (5) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12164.6 \pm 399.272$  keV $\Delta: 3950.26 \pm 1121.82$  keV

penalty: 0.172535

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13138.2 1d5/2 0.612167 1.03233

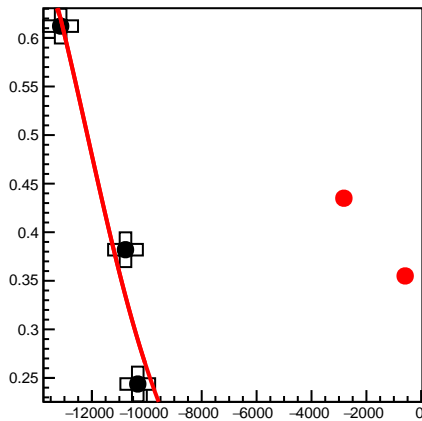
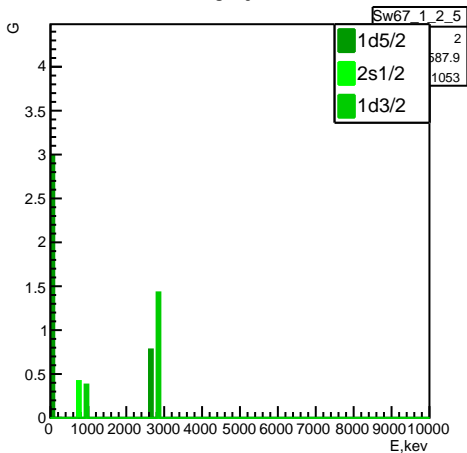
-10776.2 2s1/2 0.382 0.656

-10329.2 1d3/2 0.24375 1.4175

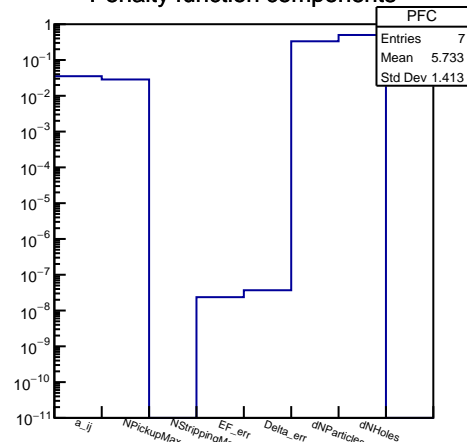
-2820.87 1g9/2 0.435 2.29741e-321

-588.767 1g7/2 0.355 6.92655e-310

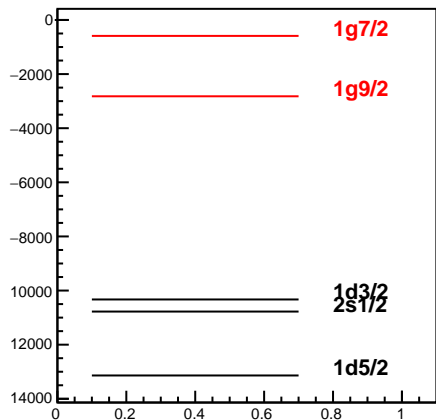
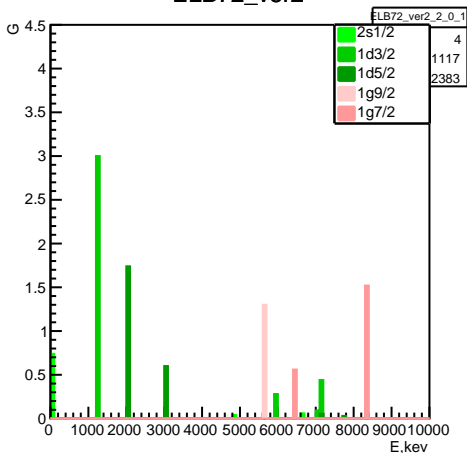
Sw67



Penalty function components



ELB72\_ver2



Experiment: Sw67 (5) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12164.6 \pm 399.272$  keV $\Delta: 3950.26 \pm 1121.82$  keV

penalty: 0.172535

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13138.2 1d5/2 0.612167 1.03233

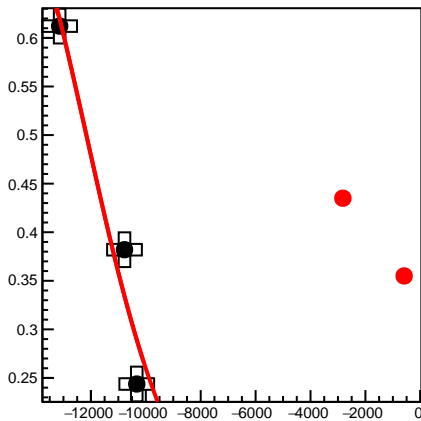
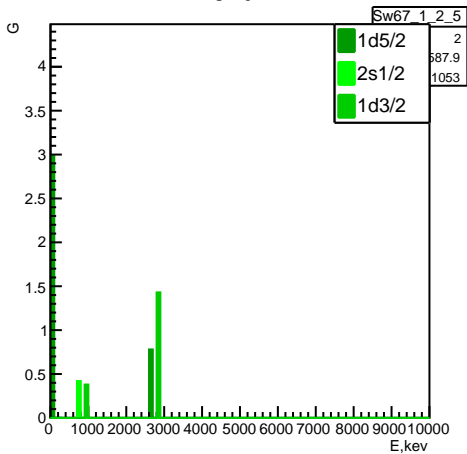
-10776.2 2s1/2 0.382 0.656

-10329.2 1d3/2 0.24375 1.4175

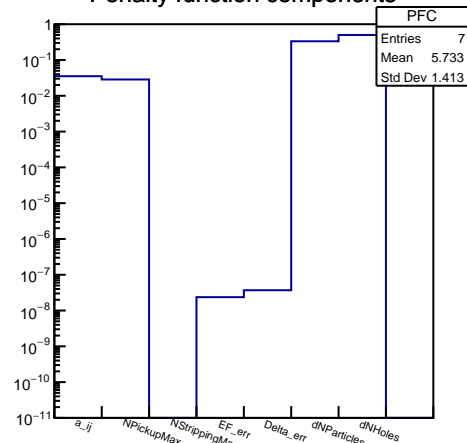
-2820.87 1g9/2 0.435 1.2732e-312

-588.767 1g7/2 0.355 2.37152e-322

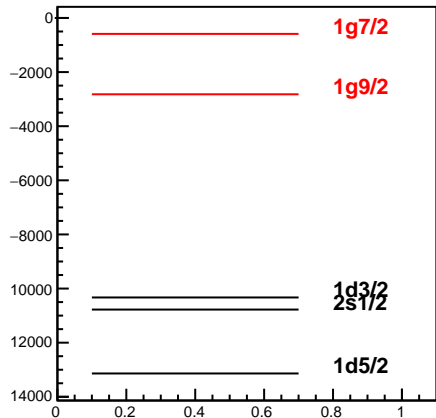
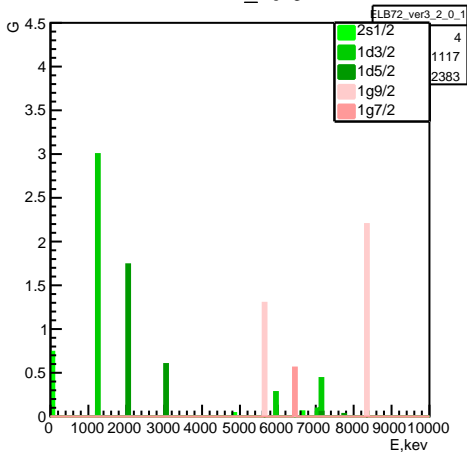
Sw67



Penalty function components



ELB72\_ver3



Experiment: Sw67 (5) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12164.6 \pm 399.272$  keV $\Delta: 3950.26 \pm 1121.82$  keV

penalty: 0.172535

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13138.2 1d5/2 0.612167 1.03233

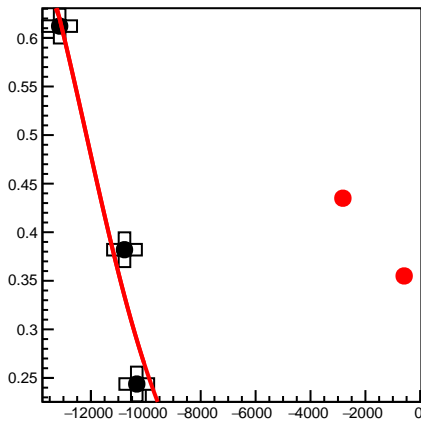
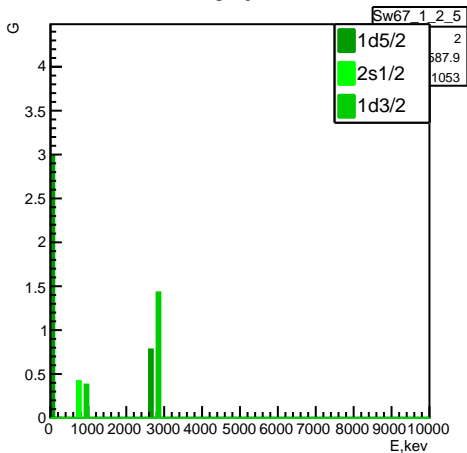
-10776.2 2s1/2 0.382 0.656

-10329.2 1d3/2 0.24375 1.4175

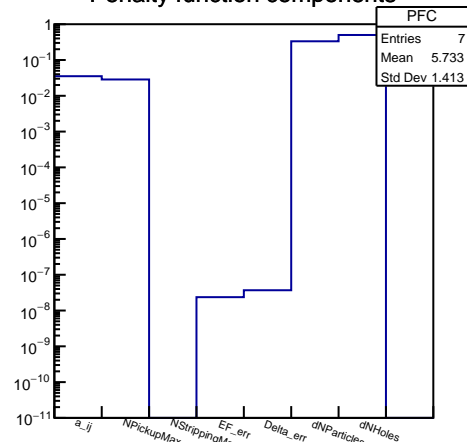
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0352778

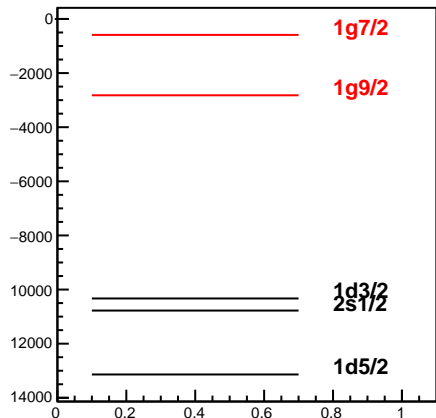
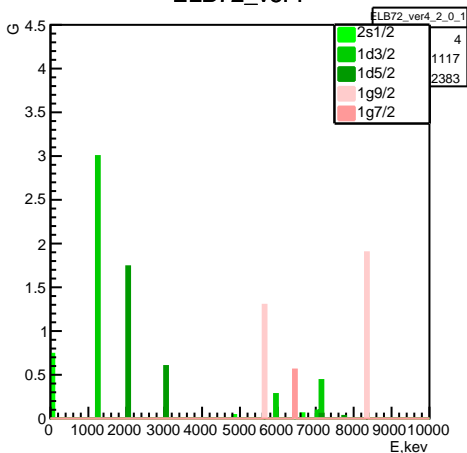
Sw67



Penalty function components



ELB72\_ver4



Experiment: Sw67 (5) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12164.6 \pm 399.272$  keV $\Delta$ :  $3950.26 \pm 1121.82$  keV

penalty: 0.172535

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13138.2 1d5/2 0.612167 1.03233

-10776.2 2s1/2 0.382 0.656

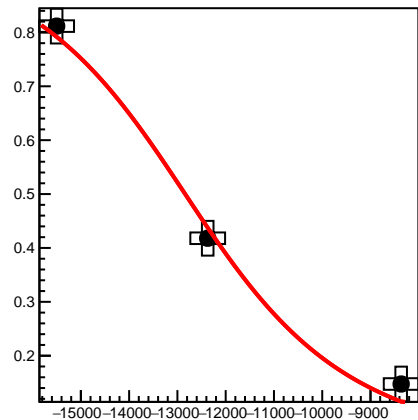
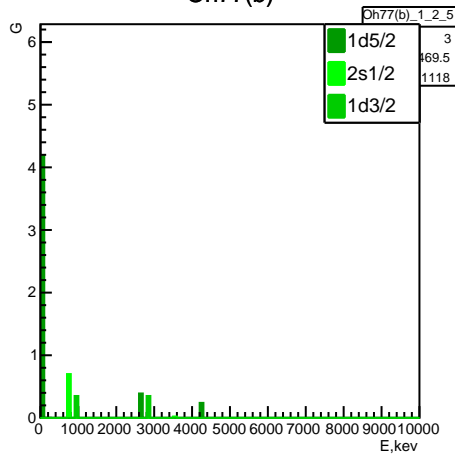
-10329.2 1d3/2 0.24375 1.4175

-2820.87 1g9/2 0.435 1.2732e-313

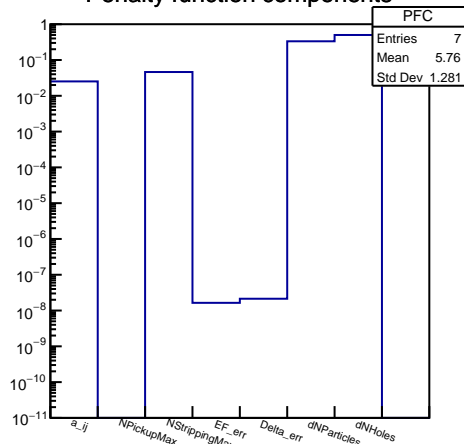
-588.767 1g7/2 0.355 2.37152e-322



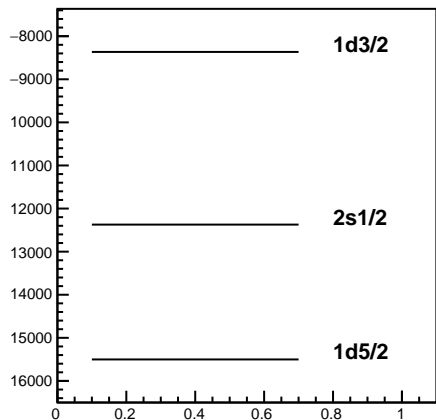
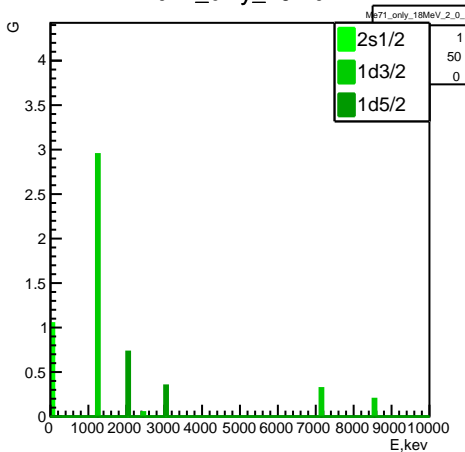
Oh77(b)



Penalty function components



Me71\_only\_18MeV



Experiment: Oh77(b) (7) Me71\_only\_18MeV  
neutron transfer

n separation energy A:17178.6, A+1: 8472.87

$E_F$ :  $-12839.2 \pm 277.089$  keV

$\Delta$ :  $3705.53 \pm 649.642$  keV

penalty: 0.173983

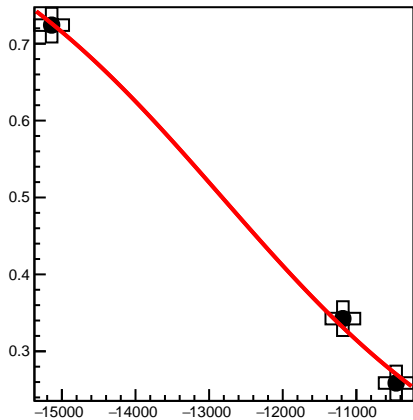
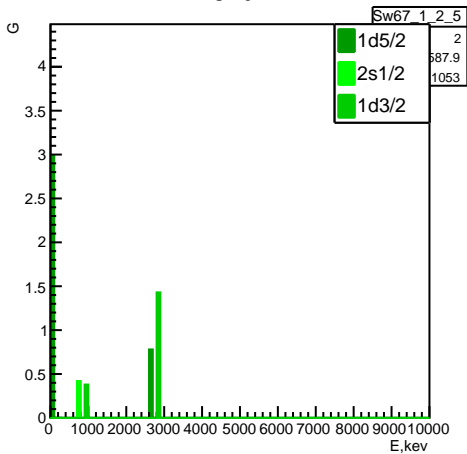
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15501.6 1d5/2 0.811667 0.983333

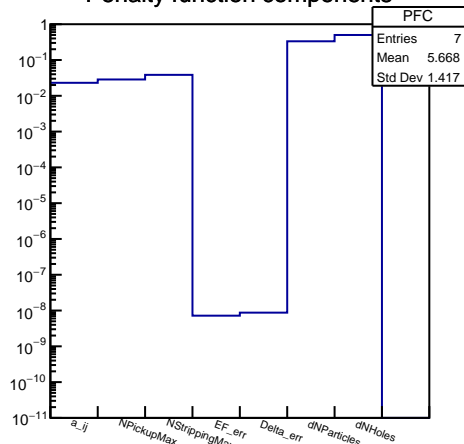
-12372.5 2s1/2 0.418 0.886

-8365.18 1d3/2 0.1475 1.055

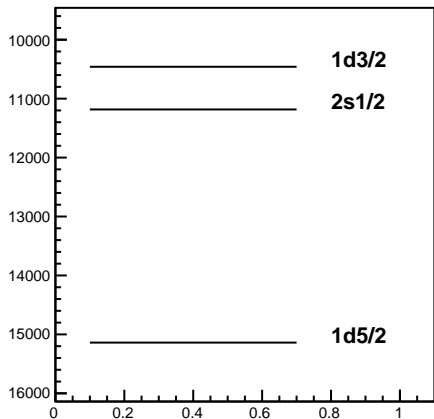
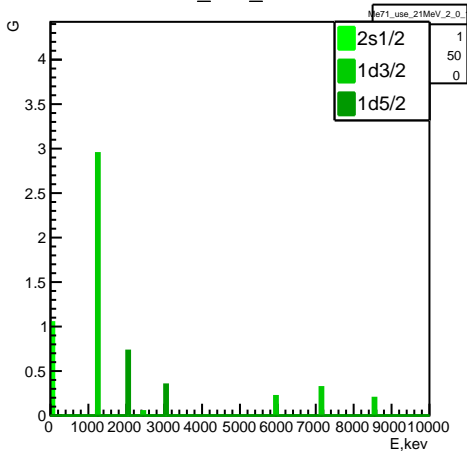
Sw67



Penalty function components

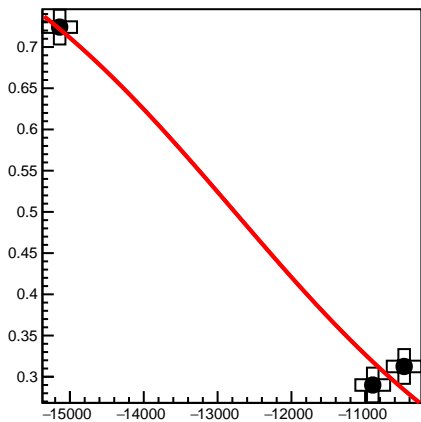
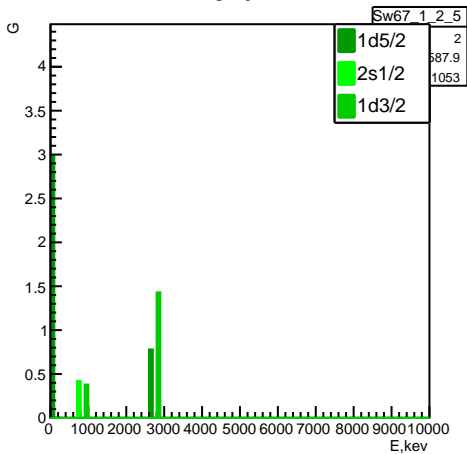


Me71\_use\_21MeV

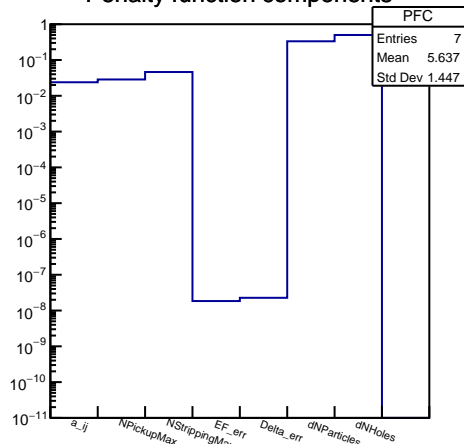


Experiment: Sw67 (5) Me71\_use\_21MeV (8)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.8  
 $E_F$ :  $-12821.8 \pm 121.369$  keV  
 $\Delta$ :  $4565.43 \pm 265.452$  keV  
 penalty: 0.177581  
 $SPE, keV \ nlj \ OCC \ \frac{G^+ + G^-}{2J+1}$   
 -15139.1 1d5/2 0.724167 0.808333  
 -11183.3 2s1/2 0.3425 0.735  
 -10459.3 1d3/2 0.25875 1.3875

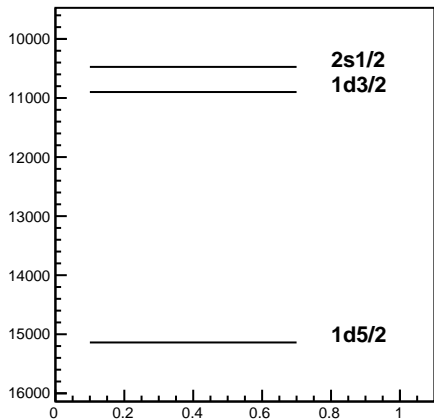
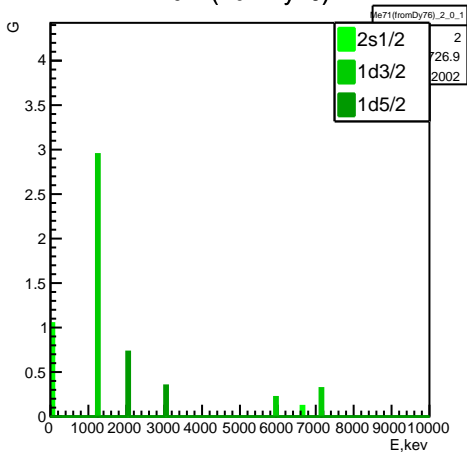
Sw67



Penalty function components

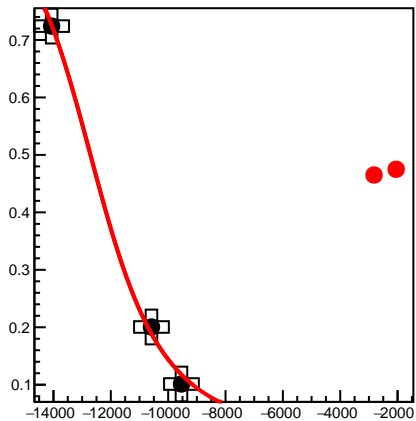
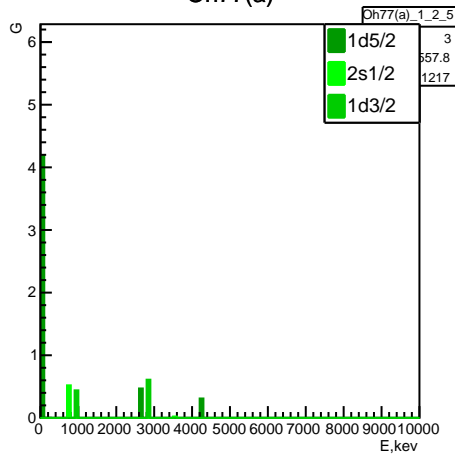


Me71(fromDy76)

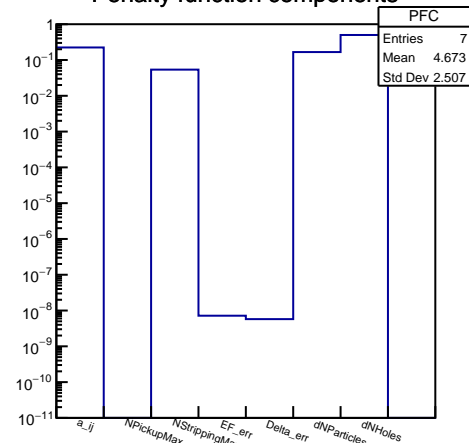


**Experiment: Sw67 (5) Me71(fromDy76) (7)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
 **$E_F$ :  $-12768 \pm 310.946$  keV**  
 **$\Delta$ :  $4790.61 \pm 689.83$  keV**  
**penalty: 0.179221**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-15139.1 1d5/2 0.724167 0.808333**  
**-10473.4 2s1/2 0.3125 0.795**  
**-10898.9 1d3/2 0.29 1.325**

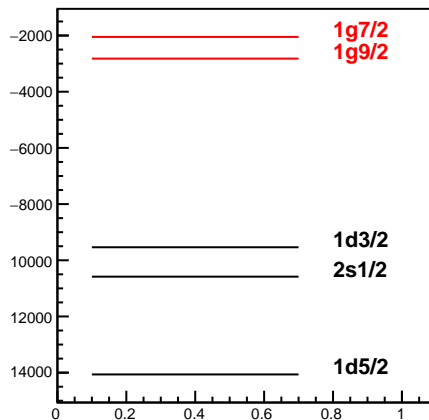
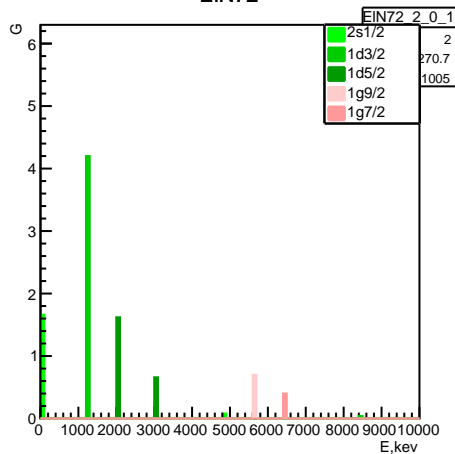
Oh77(a)



Penalty function components



EIN72



Experiment: Oh77(a) (7) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12709.1 \pm 121.082$  keV $\Delta$ :  $-2672.75 \pm 174.985$  keV

penalty: 0.181626

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-14063.3 1d5/2 0.724167 1.20833

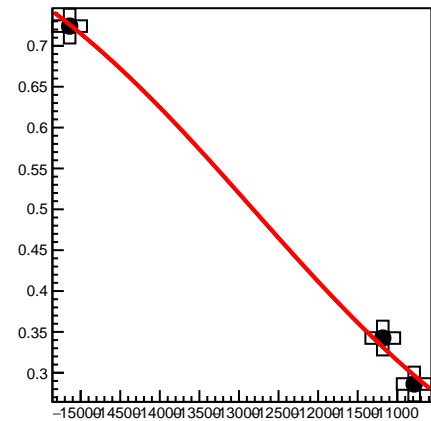
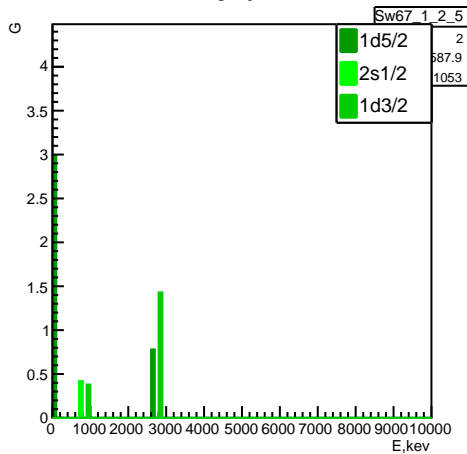
-10583 2s1/2 0.2005 1.141

-9536.41 1d3/2 0.10125 1.3225

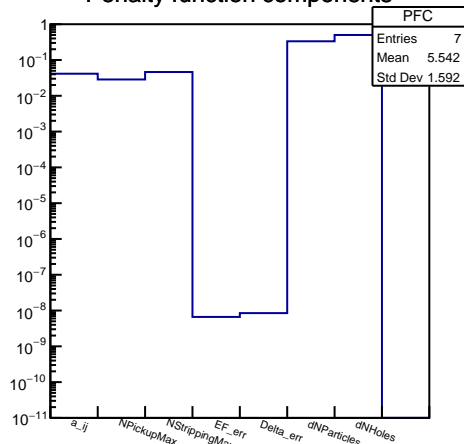
-2820.87 1g9/2 0.465 5.58294e-322

-2049.87 1g7/2 0.475 6.92655e-310

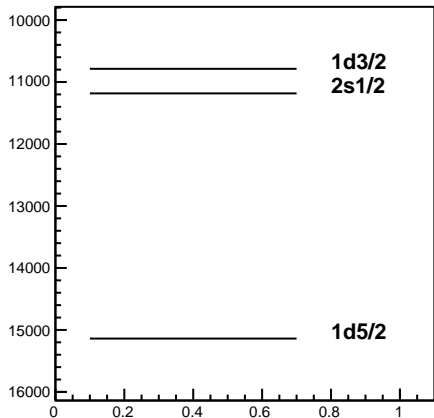
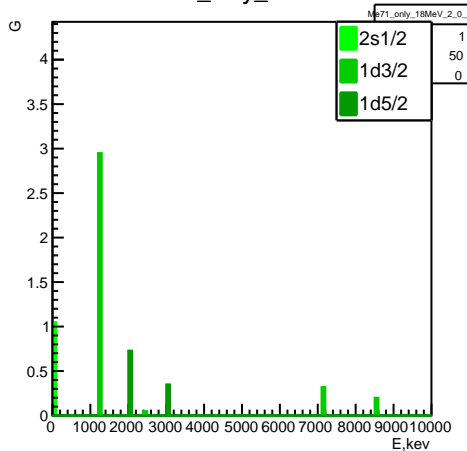
Sw67



Penalty function components



Me71\_only\_18MeV



Experiment: Sw67 (5) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12821.8 \pm 111.923 \text{ keV}$  $\Delta: 4574.83 \pm 257.656 \text{ keV}$ 

penalty: 0.182586

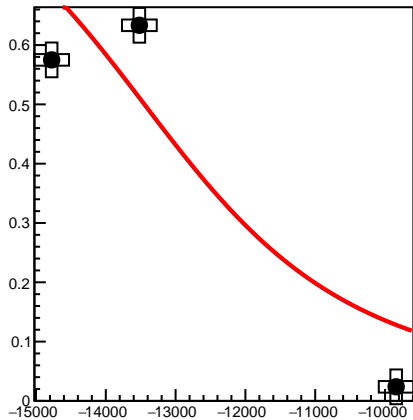
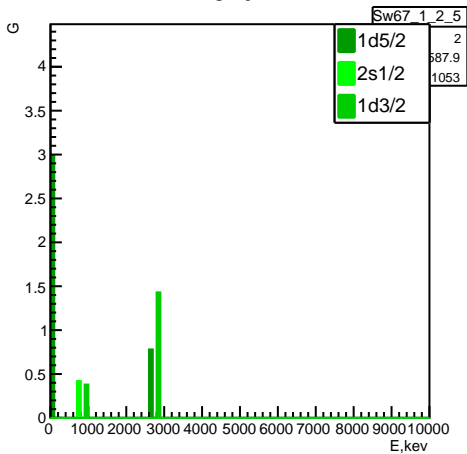
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15139.1 1d5/2 0.724167 0.808333

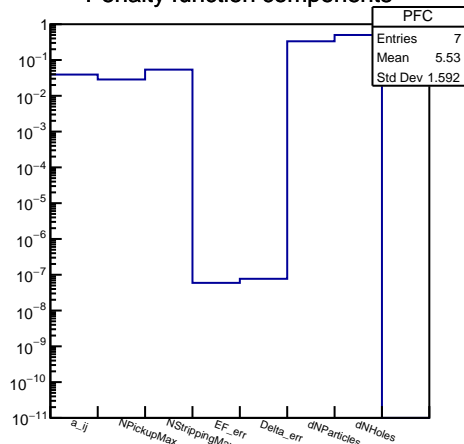
-11183.3 2s1/2 0.3425 0.735

-10786.8 1d3/2 0.28625 1.3325

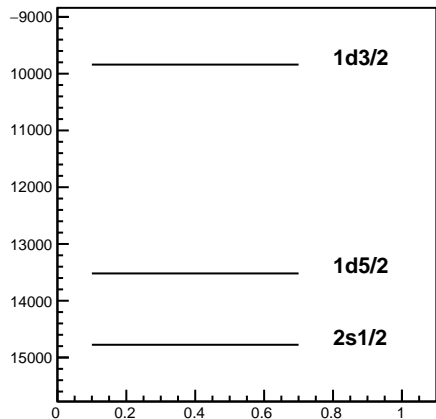
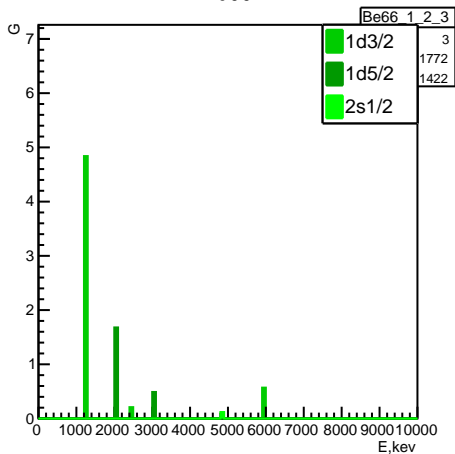
Sw67



Penalty function components



Be66



Experiment: Sw67 (5) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -13447.1 \pm 1001.37 \text{ keV}$  $\Delta: 3241.22 \pm 2341.43 \text{ keV}$ 

penalty: 0.183638

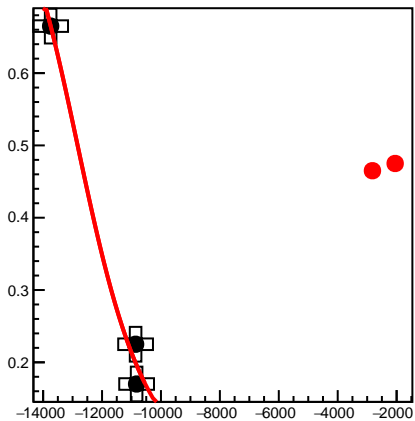
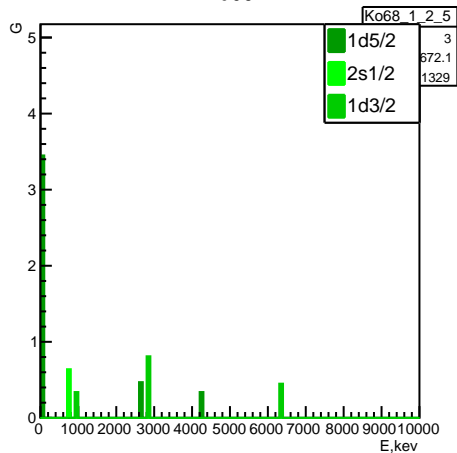
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13519.1 1d5/2 0.633333 0.99

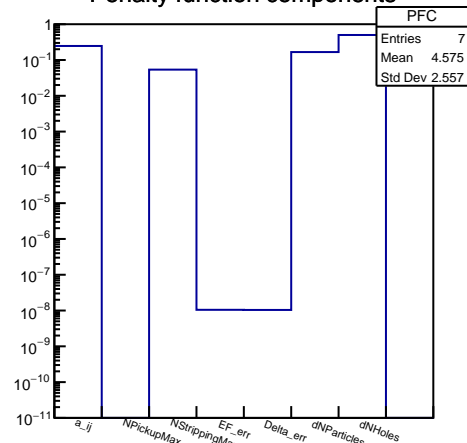
-14775.8 2s1/2 0.575 0.27

-9840.02 1d3/2 0.02375 1.8575

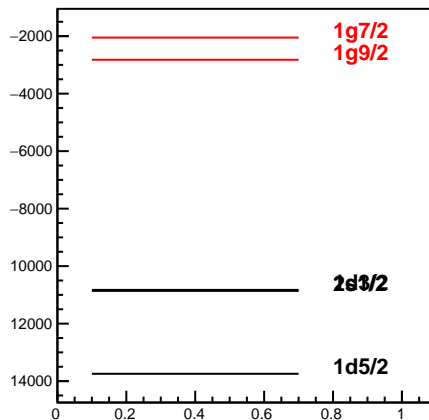
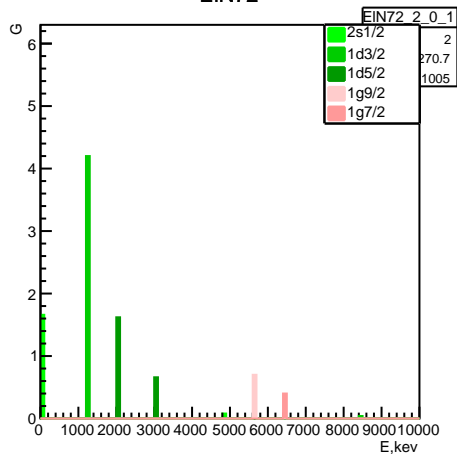
Ko68



Penalty function components



EIN72



Experiment: Ko68 (7) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12829.6  $\pm$  176.908 keV

$\Delta$ : -2614.15  $\pm$  315.866 keV

penalty: 0.185996

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13744.8 1d5/2 0.665 1.09

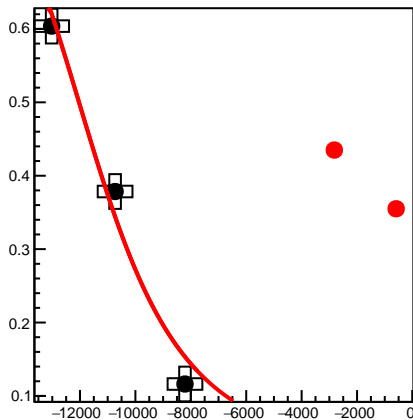
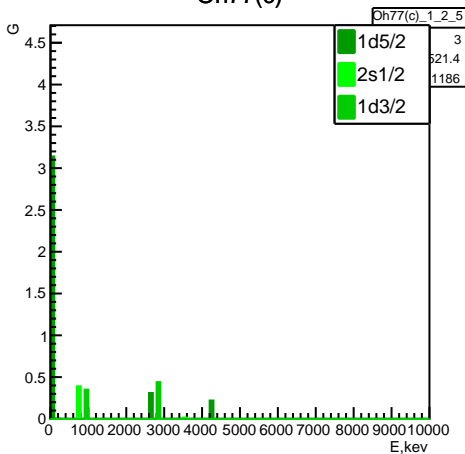
-10861.2 2s1/2 0.225 1.19

-10826.4 1d3/2 0.17 1.46

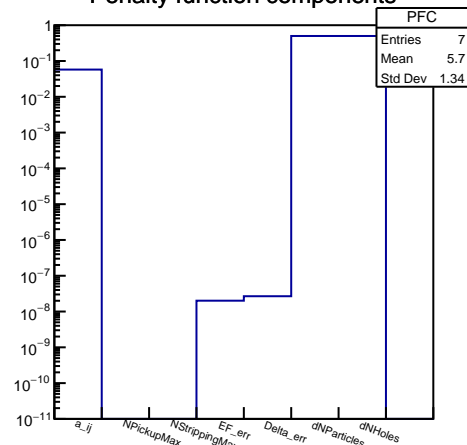
-2820.87 1g9/2 0.465 5.58294e-322

-2049.87 1g7/2 0.475 6.92655e-310

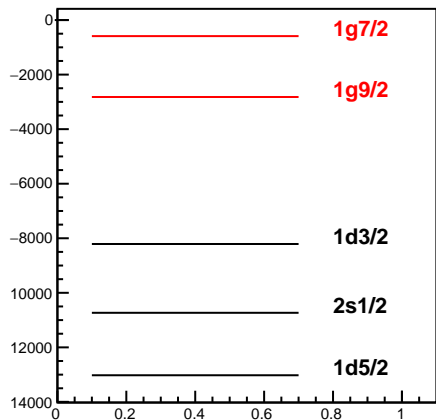
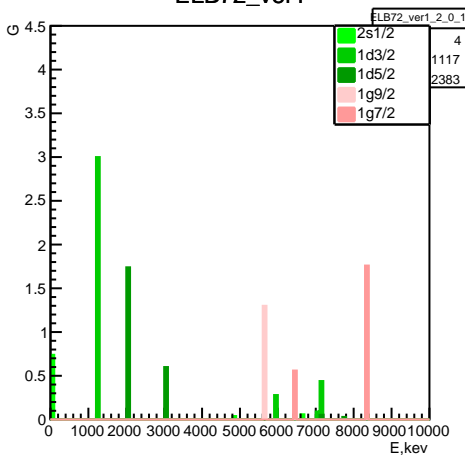
Oh77(c)



Penalty function components



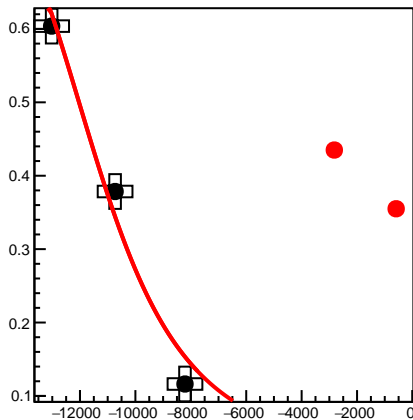
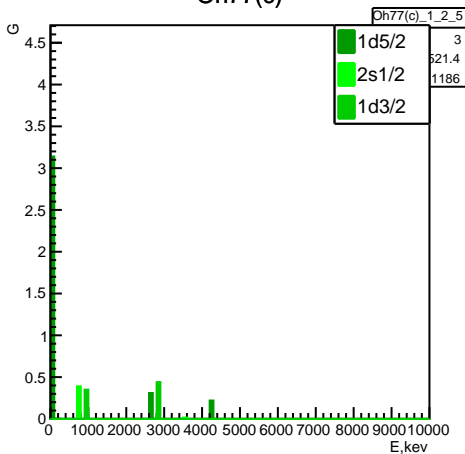
ELB72\_ver1



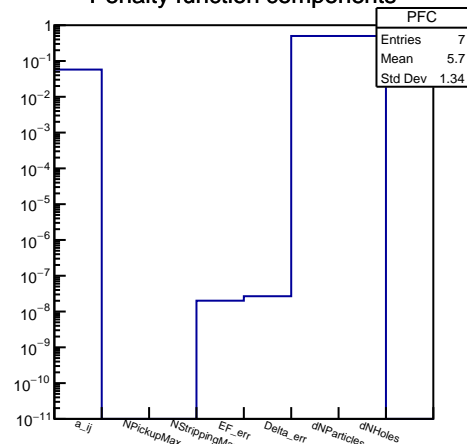
Experiment: Oh77(c) (7) ELB72\_ver1 (16)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F$ :  $-12034.5 \pm 339.413$  keV  
 $\Delta$ :  $3974.9 \pm 814.096$  keV  
 penalty: 0.203387  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -13022.6 1d5/2 0.603833 1.01567  
 -10732.8 2s1/2 0.3785 0.649  
 -8210.28 1d3/2 0.11625 1.1625  
 -2820.87 1g9/2 0.435 3.21143e-322  
 -588.767 1g7/2 0.355 0.0576111



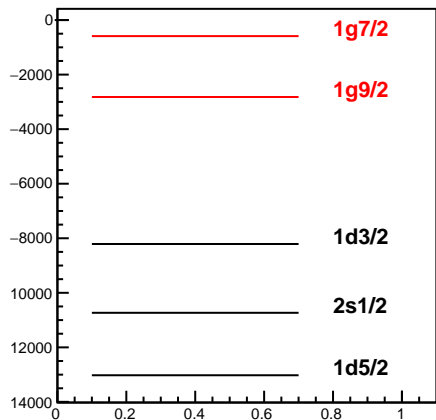
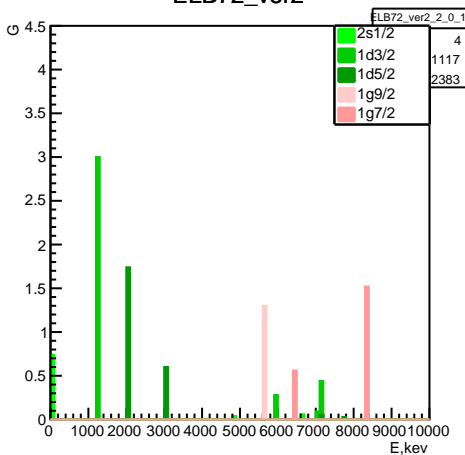
Oh77(c)



Penalty function components

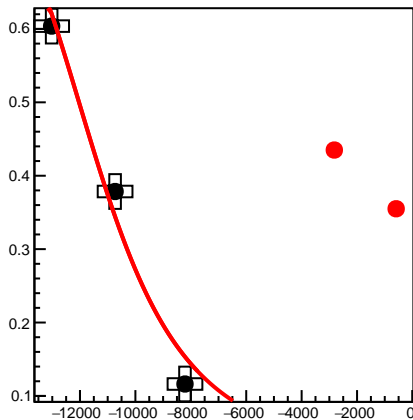
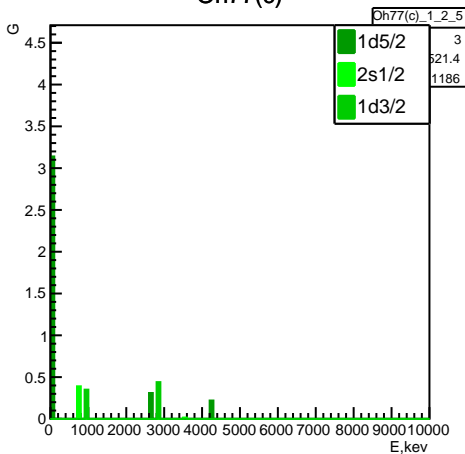


ELB72\_ver2

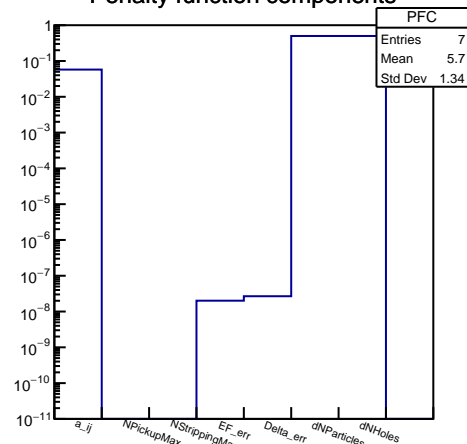


Experiment: Oh77(c) (7) ELB72\_ver2 (16)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F$ :  $-12034.5 \pm 339.413$  keV  
 $\Delta$ :  $3974.9 \pm 814.096$  keV  
 penalty: 0.203387  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -13022.6 1d5/2 0.603833 1.01567  
 -10732.8 2s1/2 0.3785 0.649  
 -8210.28 1d3/2 0.11625 1.1625  
 -2820.87 1g9/2 0.435 4.68096e-310  
 -588.767 1g7/2 0.355 2.37152e-322

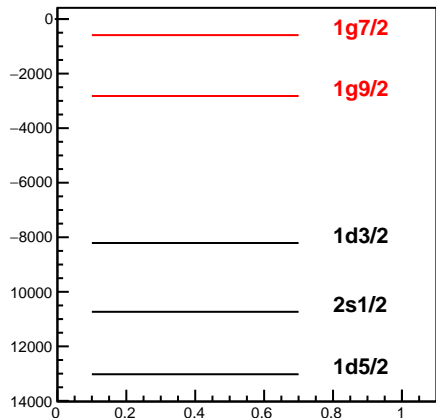
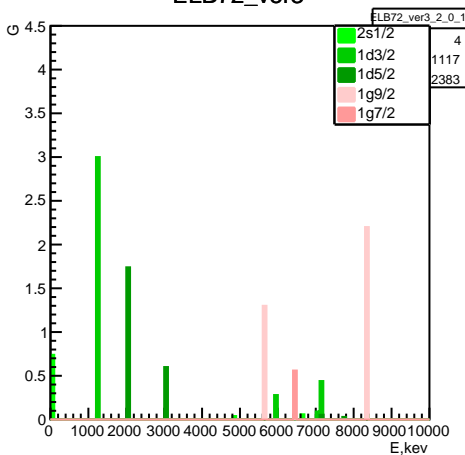
Oh77(c)



Penalty function components

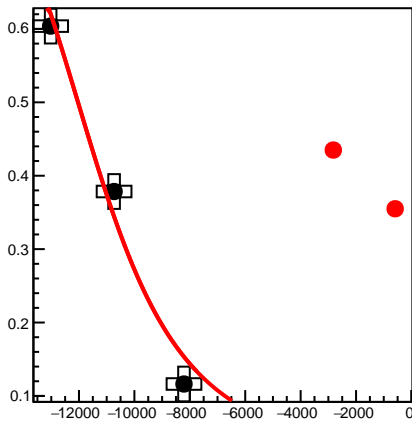
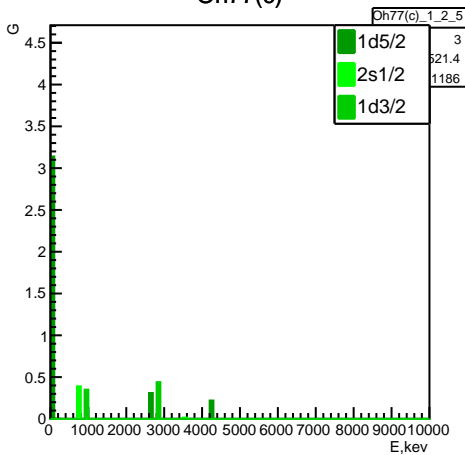


ELB72\_ver3

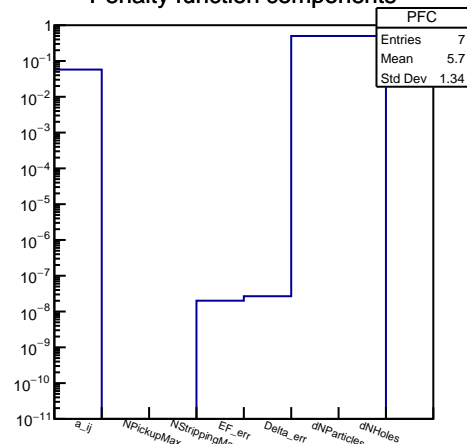


Experiment: Oh77(c) (7) ELB72\_ver3 (16)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F$ :  $-12034.5 \pm 339.413$  keV  
 $\Delta$ :  $3974.9 \pm 814.096$  keV  
 penalty: 0.203387  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -13022.6 1d5/2 0.603833 1.01567  
 -10732.8 2s1/2 0.3785 0.649  
 -8210.28 1d3/2 0.11625 1.1625  
 -2820.87 1g9/2 0.435 1.57028e-312  
 -588.767 1g7/2 0.355 2.37152e-322

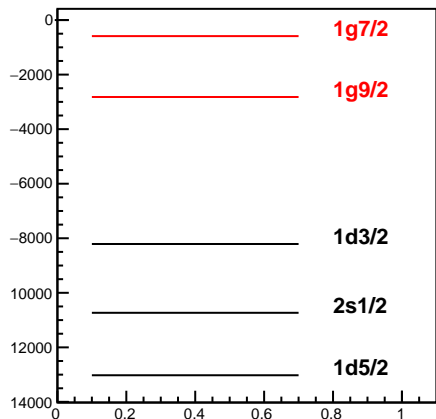
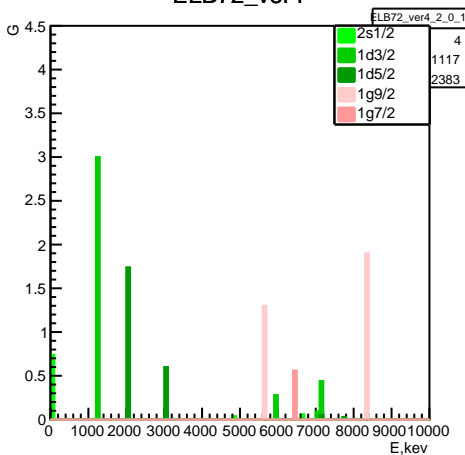
Oh77(c)



Penalty function components

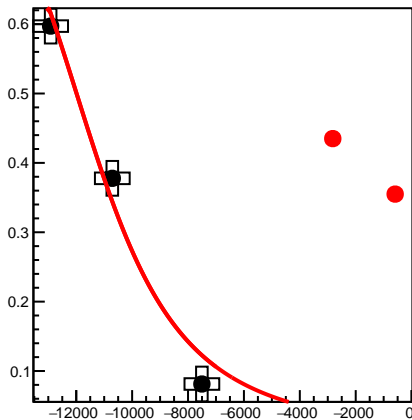
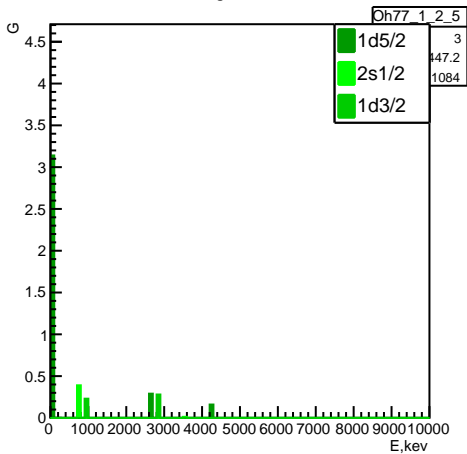


ELB72\_ver4

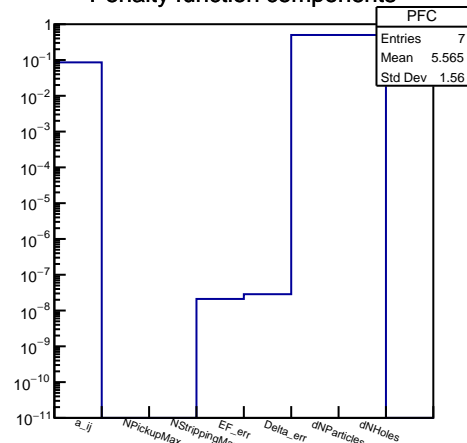


**Experiment: Oh77(c) (7) ELB72\_ver4 (16)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
 **$E_F$ :  $-12034.5 \pm 339.413$  keV**  
 **$\Delta$ :  $3974.9 \pm 814.096$  keV**  
**penalty: 0.203387**  
**SPE, keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-13022.6 1d5/2 0.603833 1.01567**  
**-10732.8 2s1/2 0.3785 0.649**  
**-8210.28 1d3/2 0.11625 1.1625**  
**-2820.87 1g9/2 0.435 1.2732e-313**  
**-588.767 1g7/2 0.355 2.37152e-322**

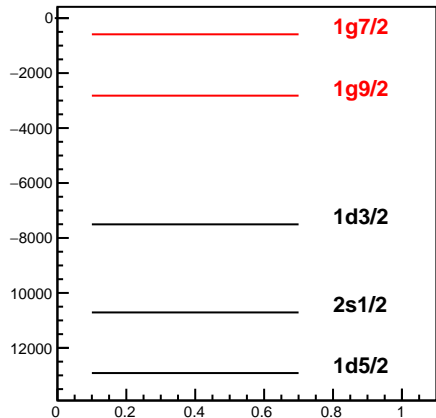
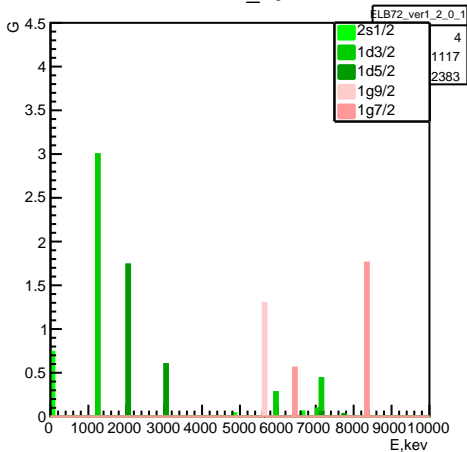
Oh77



Penalty function components



ELB72\_ver1



Experiment: Oh77 (7) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -11988.3 \pm 355.981$  keV $\Delta: 3899.94 \pm 870.101$  keV

penalty: 0.208825

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-12915.7 1d5/2 0.597167 1.00233

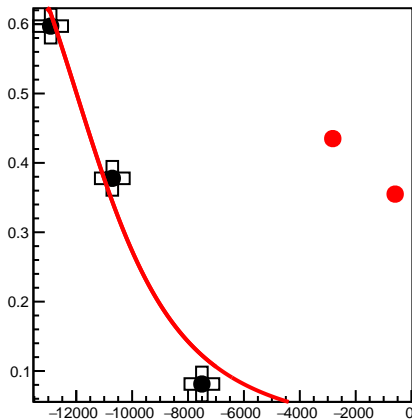
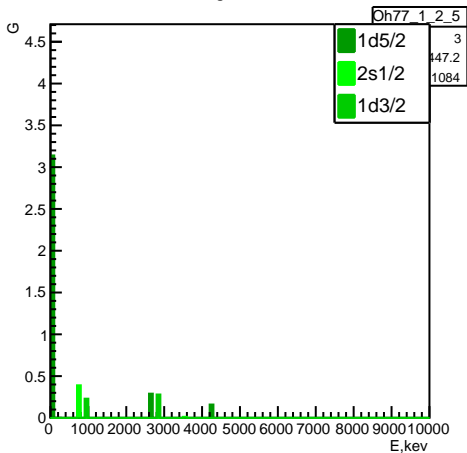
-10709.6 2s1/2 0.37775 0.6475

-7504.41 1d3/2 0.08125 1.0925

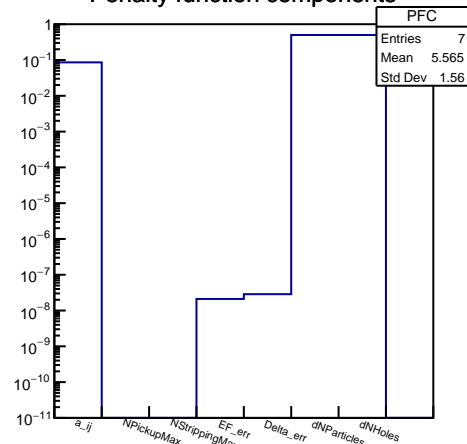
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

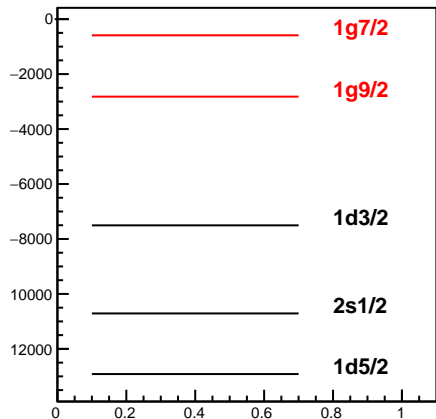
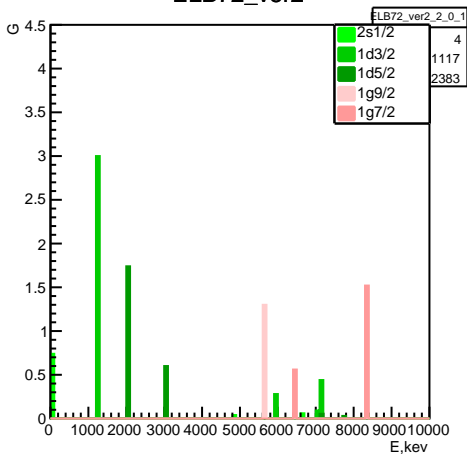
Oh77



Penalty function components



ELB72\_ver2



Experiment: Oh77 (7) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -11988.3 \pm 355.981$  keV $\Delta: 3899.94 \pm 870.101$  keV

penalty: 0.208825

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-12915.7 1d5/2 0.597167 1.00233

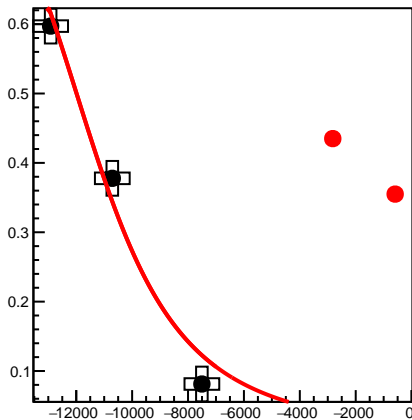
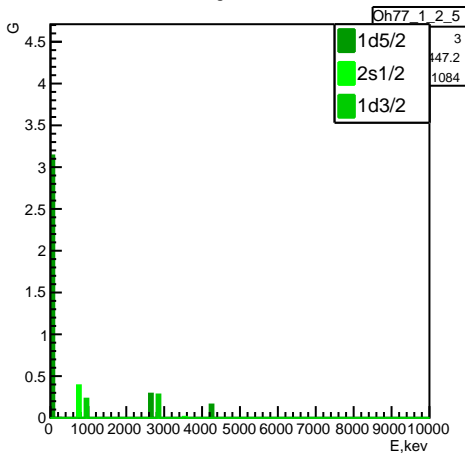
-10709.6 2s1/2 0.37775 0.6475

-7504.41 1d3/2 0.08125 1.0925

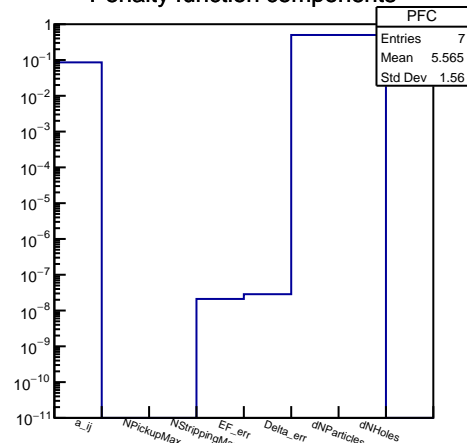
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0858889

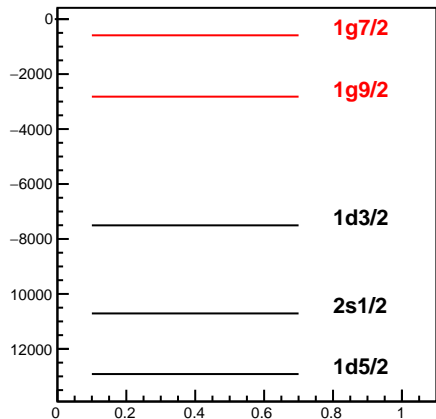
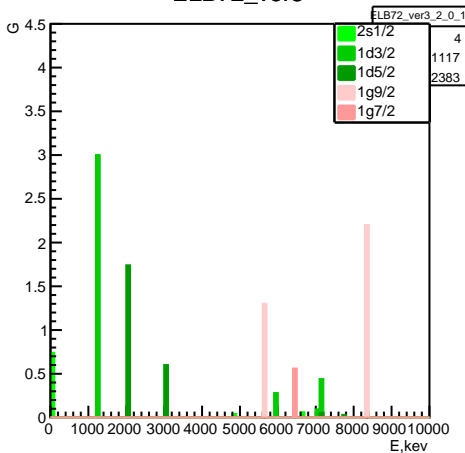
Oh77



Penalty function components



ELB72\_ver3



Experiment: Oh77 (7) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -11988.3 \pm 355.981$  keV $\Delta: 3899.94 \pm 870.101$  keV

penalty: 0.208825

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-12915.7 1d5/2 0.597167 1.00233

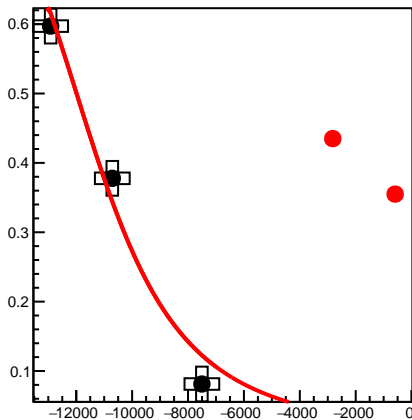
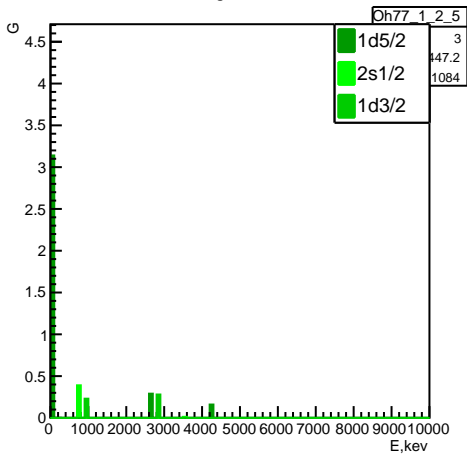
-10709.6 2s1/2 0.37775 0.6475

-7504.41 1d3/2 0.08125 1.0925

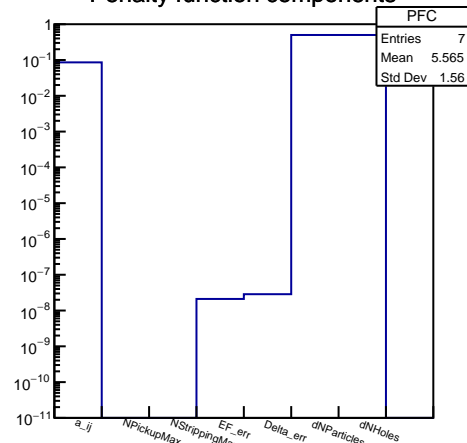
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

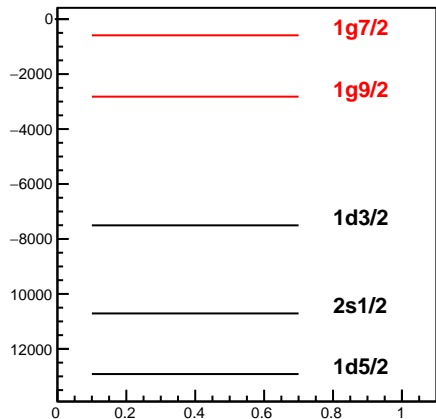
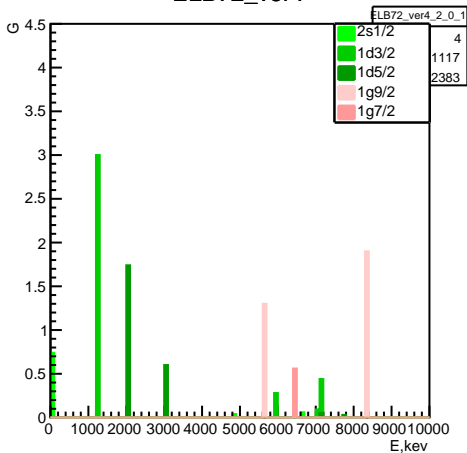
Oh77



Penalty function components



ELB72\_ver4



Experiment: Oh77 (7) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -11988.3 \pm 355.981$  keV $\Delta: 3899.94 \pm 870.101$  keV

penalty: 0.208825

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-12915.7 1d5/2 0.597167 1.00233

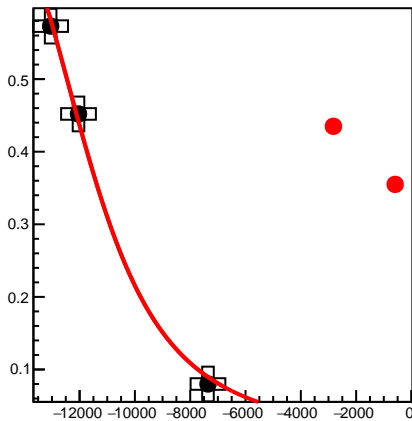
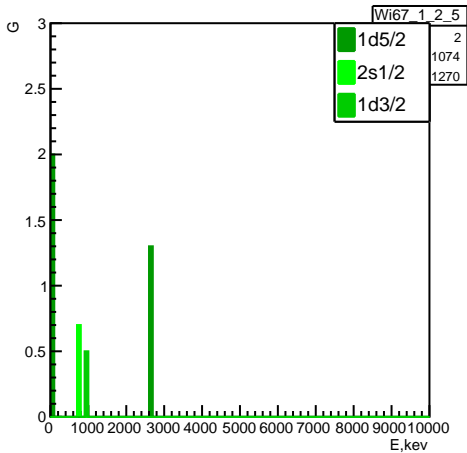
-10709.6 2s1/2 0.37775 0.6475

-7504.41 1d3/2 0.08125 1.0925

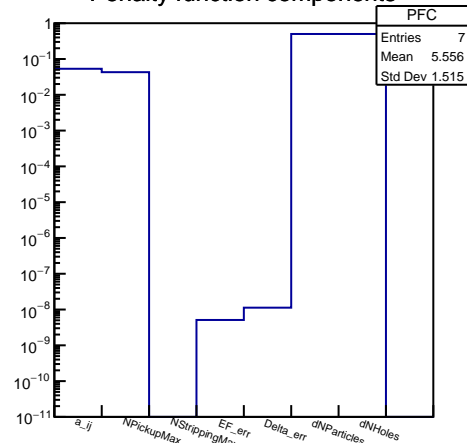
-2820.87 1g9/2 0.435 4.68097e-310

-588.767 1g7/2 0.355 2.37152e-322

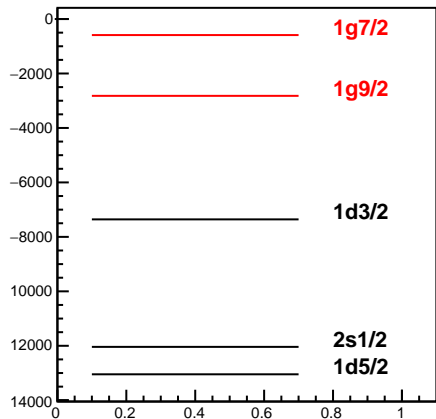
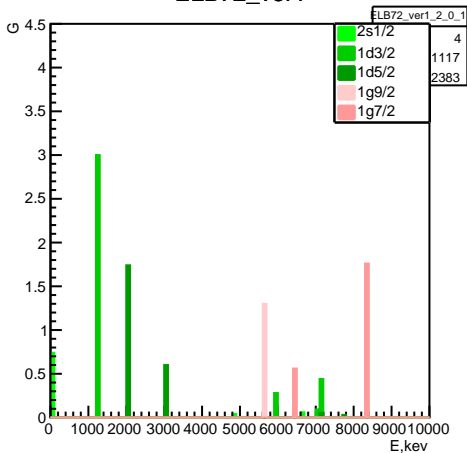
Wi67



Penalty function components



ELB72\_ver1



Experiment: Wi67 (4) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

$E_F$ :  $-12457 \pm 86.3113$  keV

$\Delta$ :  $3550.24 \pm 342.851$  keV

penalty: 0.210806

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13047 1d5/2 0.573 0.954

-12039.6 2s1/2 0.452 0.796

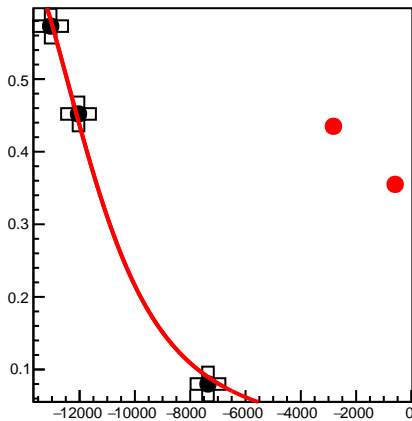
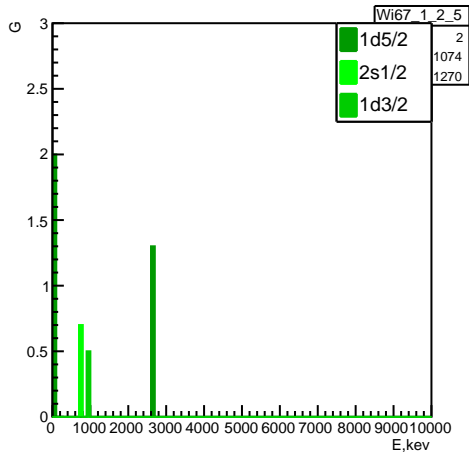
-7357.44 1d3/2 0.08 1.09

-2820.87 1g9/2 0.435 1.2732e-313

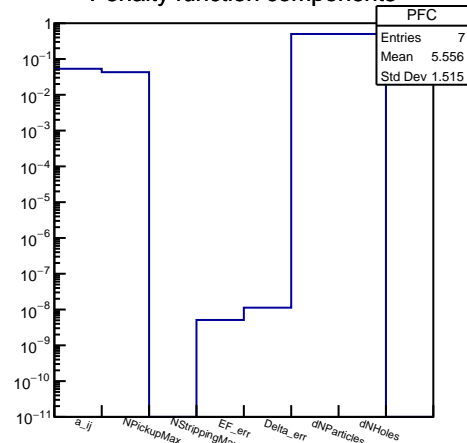
-588.767 1g7/2 0.355 2.37152e-322



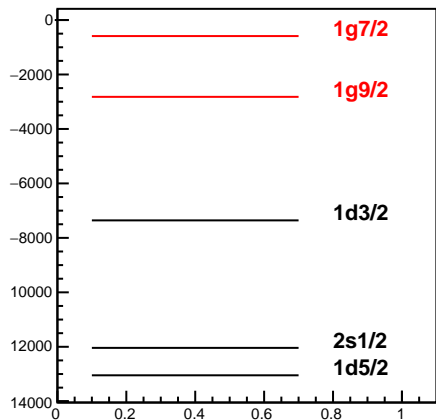
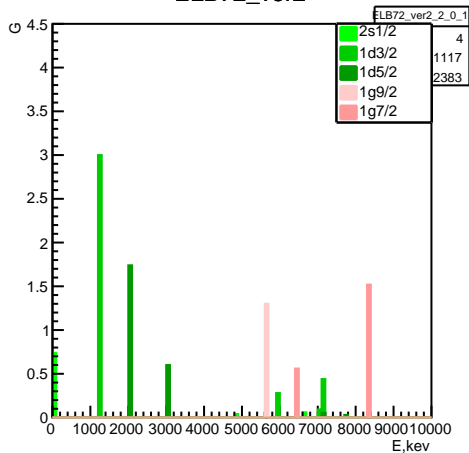
Wi67



Penalty function components



ELB72\_ver2



Experiment: Wi67 (4) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12457 ± 86.3113 keV

Δ: 3550.24 ± 342.851 keV

penalty: 0.210806

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13047 1d5/2 0.573 0.954

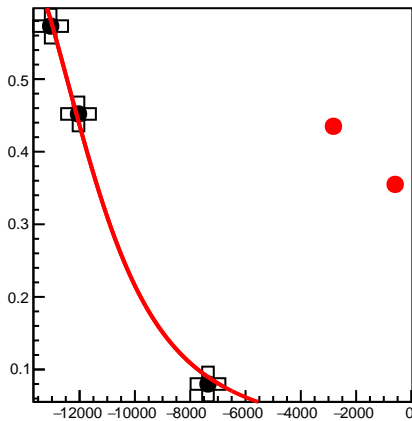
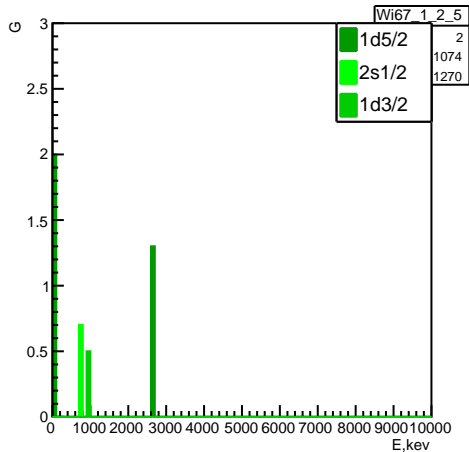
-12039.6 2s1/2 0.452 0.796

-7357.44 1d3/2 0.08 1.09

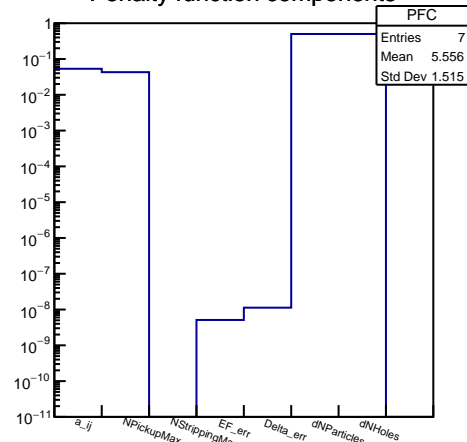
-2820.87 1g9/2 0.435 8.74496e-322

-588.767 1g7/2 0.355 0.5

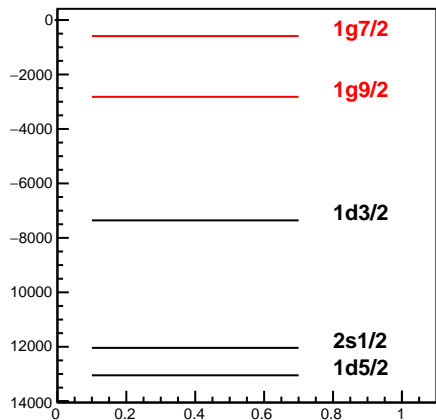
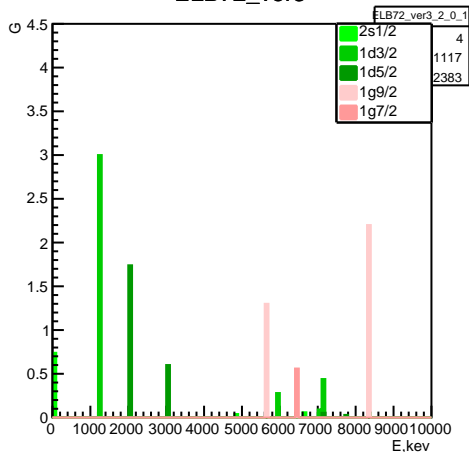
Wi67



Penalty function components



ELB72\_ver3



Experiment: Wi67 (4) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12457 \pm 86.3113 \text{ keV}$  $\Delta: 3550.24 \pm 342.851 \text{ keV}$ 

penalty: 0.210806

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13047 1d5/2 0.573 0.954

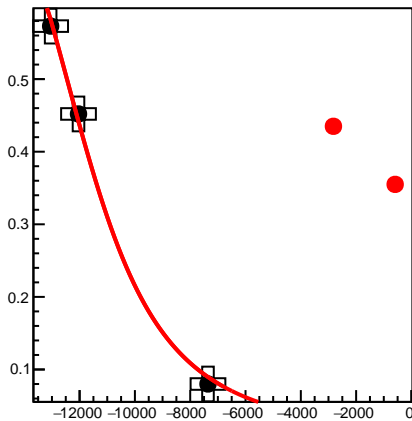
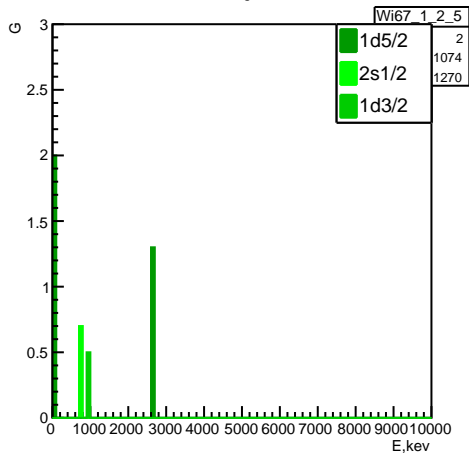
-12039.6 2s1/2 0.452 0.796

-7357.44 1d3/2 0.08 1.09

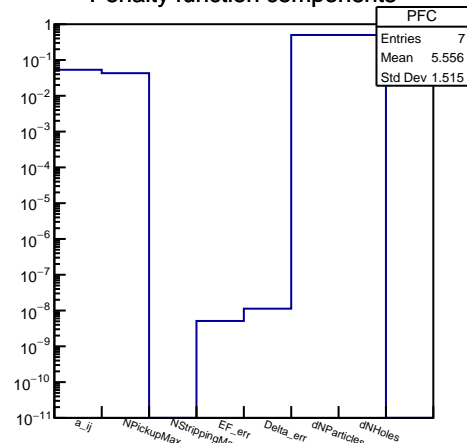
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

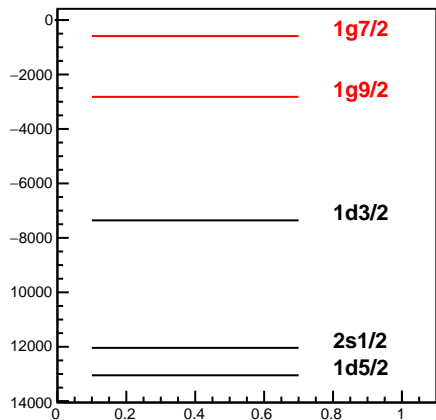
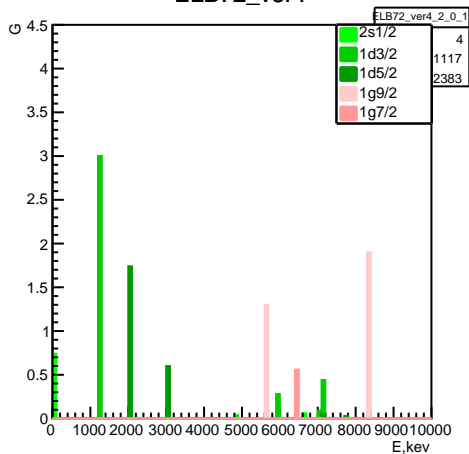
Wi67



Penalty function components



ELB72\_ver4



Experiment: Wi67 (4) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

$E_F$ :  $-12457 \pm 86.3113$  keV

$\Delta$ :  $3550.24 \pm 342.851$  keV

penalty: 0.210806

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13047 1d5/2 0.573 0.954

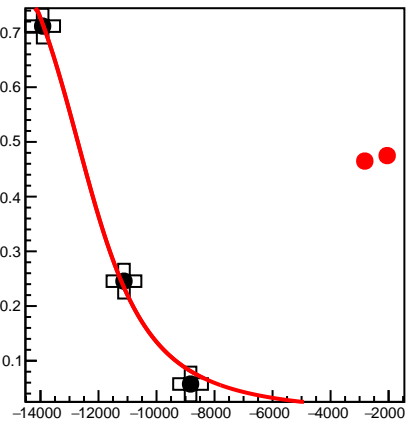
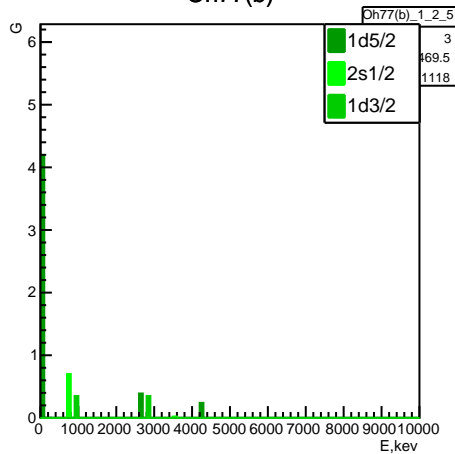
-12039.6 2s1/2 0.452 0.796

-7357.44 1d3/2 0.08 1.09

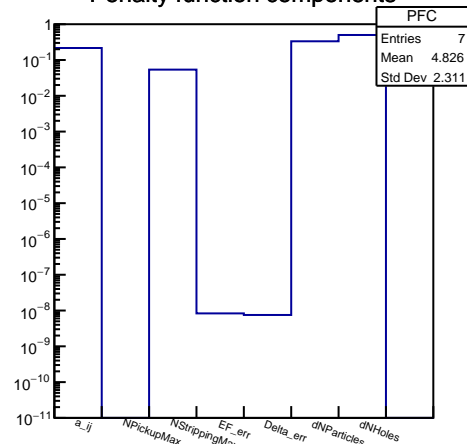
-2820.87 1g9/2 0.435 5.58294e-322

-588.767 1g7/2 0.355 6.92655e-310

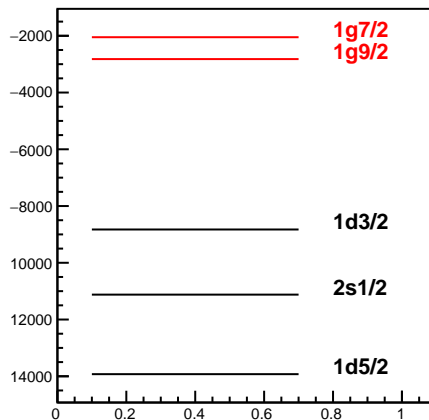
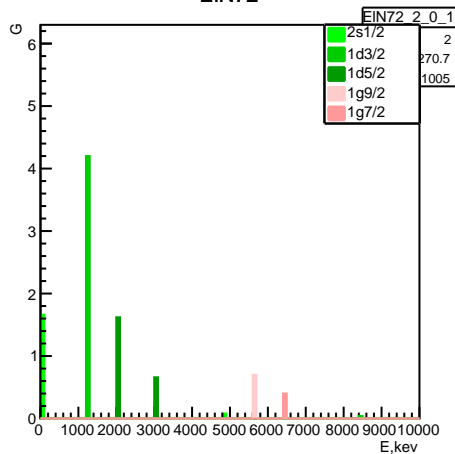
Oh77(b)



Penalty function components



EIN72



Experiment: Oh77(b) (7) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -12713  $\pm$  140.528 keV $\Delta$ : -2531.81  $\pm$  228.541 keV

penalty: 0.212235

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13925.4 1d5/2 0.711667 1.18333

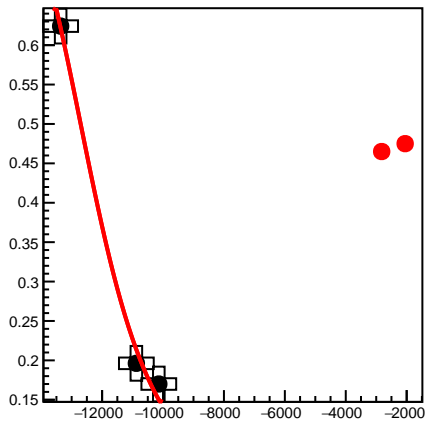
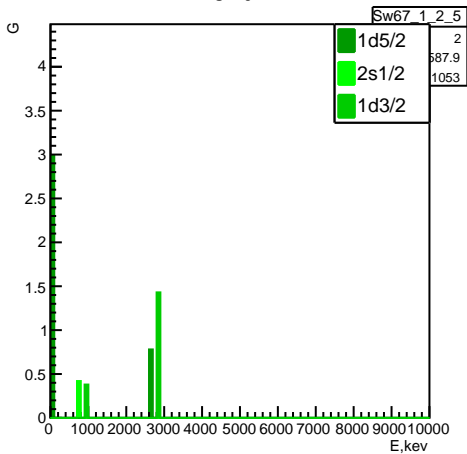
-11122.3 2s1/2 0.2455 1.231

-8826.65 1d3/2 0.0575 1.235

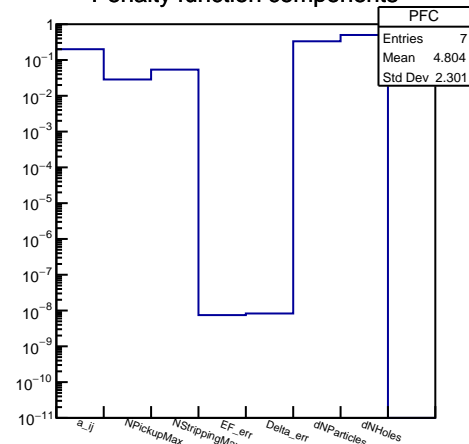
-2820.87 1g9/2 0.465 5.58294e-322

-2049.87 1g7/2 0.475 6.92655e-310

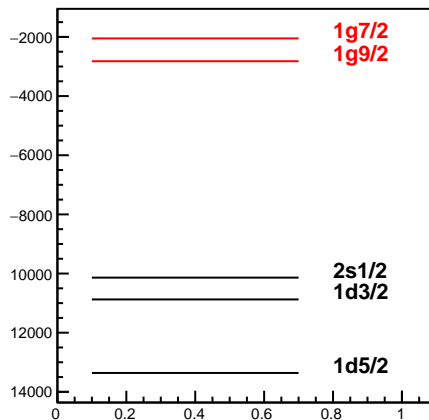
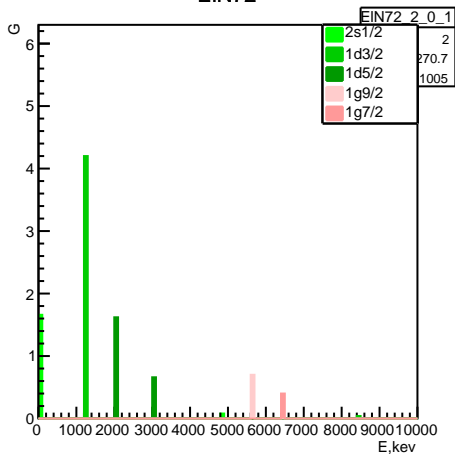
Sw67



Penalty function components



EIN72



Experiment: Sw67 (5) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12704.3 \pm 125.946 \text{ keV}$  $\Delta: 2616.69 \pm 251.497 \text{ keV}$ 

penalty: 0.214621

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13361.3 1d5/2 0.624167 1.00833

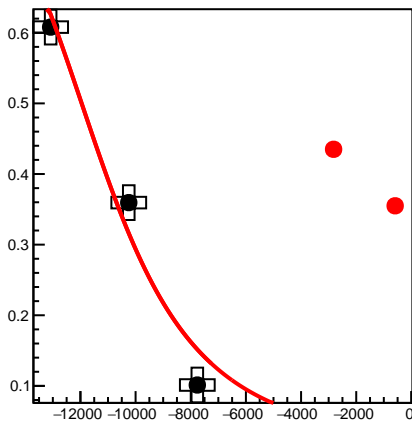
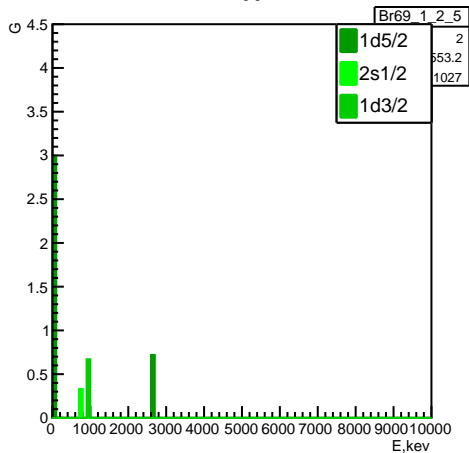
-10138.2 2s1/2 0.17 1.08

-10875.4 1d3/2 0.19625 1.5125

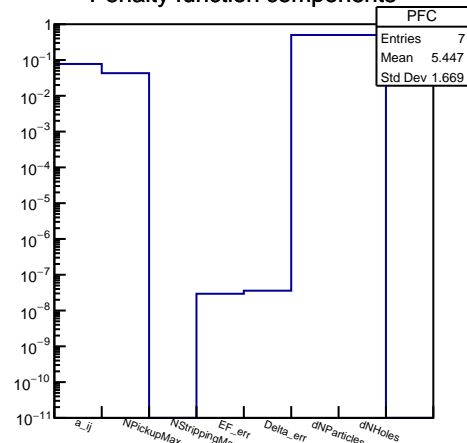
-2820.87 1g9/2 0.465 5.58294e-322

-2049.87 1g7/2 0.475 6.92655e-310

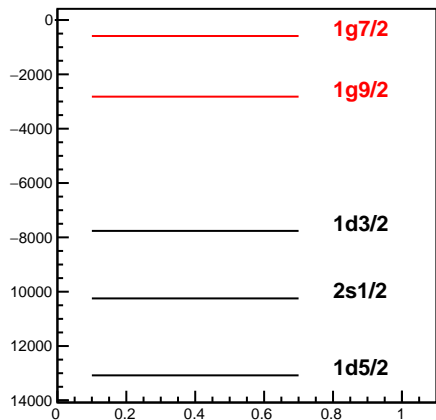
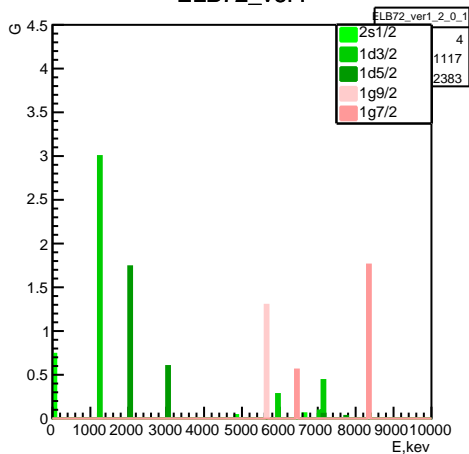
Br69



Penalty function components



ELB72\_ver1



Experiment: Br69 (4) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -11955 ± 497.012 keV

Δ: -4317.38 ± 1090.1 keV

penalty: 0.215453

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13079.5 1d5/2 0.608 1.024

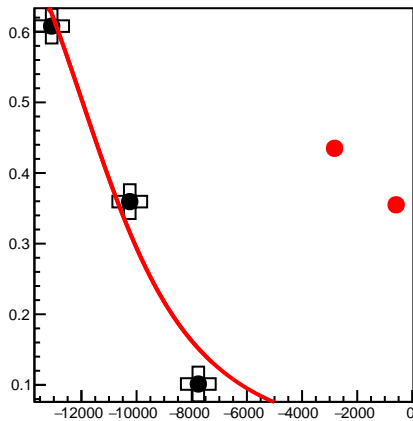
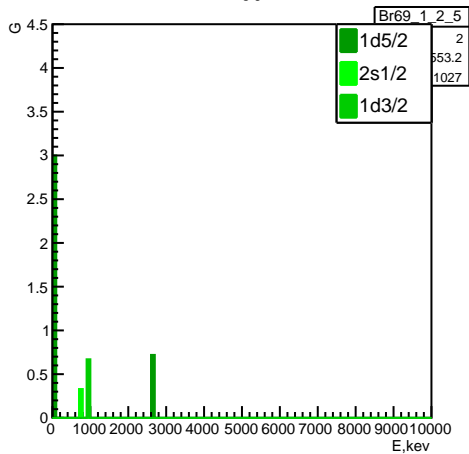
-10247.2 2s1/2 0.3595 0.611

-7761.93 1d3/2 0.10125 1.1325

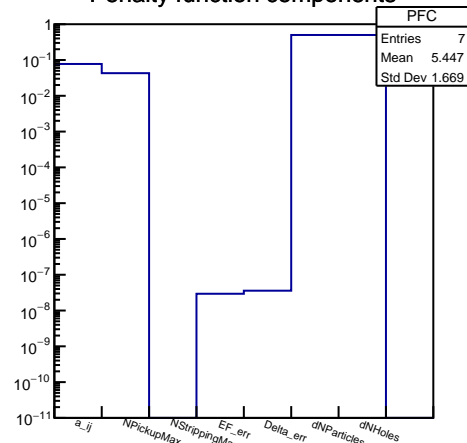
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0775

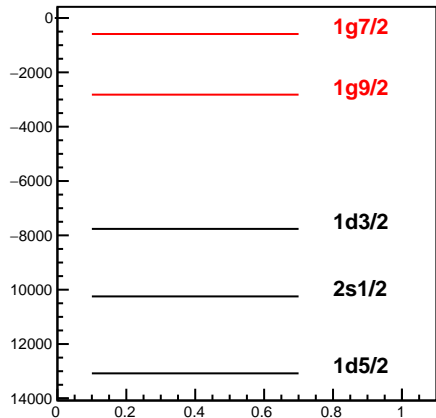
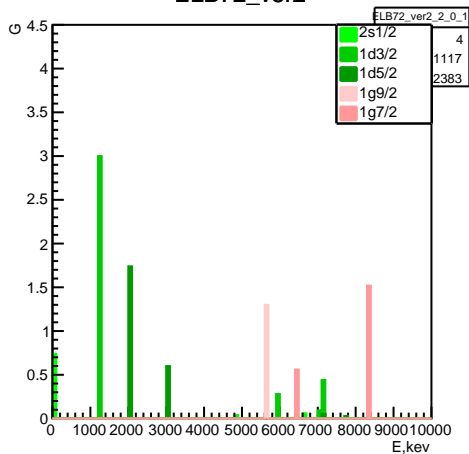
Br69



Penalty function components



ELB72\_ver2



Experiment: Br69 (4) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -11955 ± 497.012 keV

Δ: -4317.38 ± 1090.1 keV

penalty: 0.215453

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13079.5 1d5/2 0.608 1.024

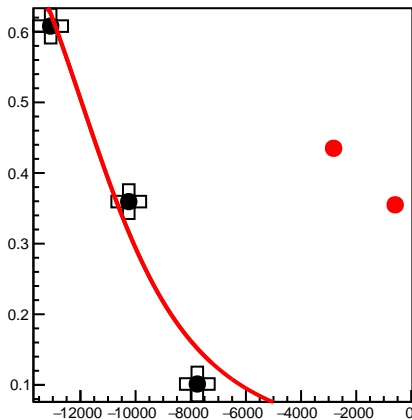
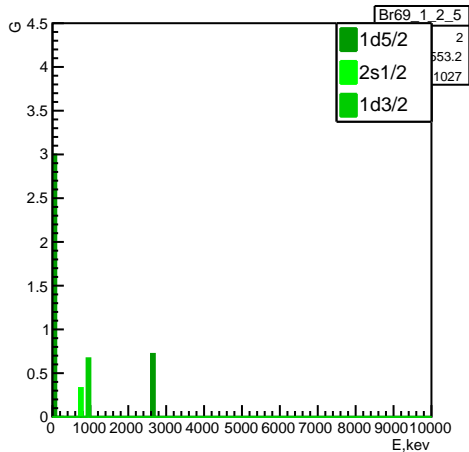
-10247.2 2s1/2 0.3595 0.611

-7761.93 1d3/2 0.10125 1.1325

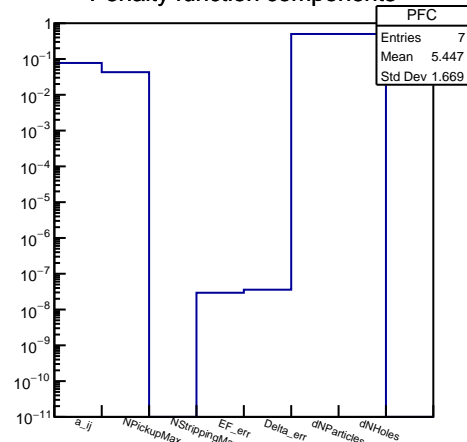
-2820.87 1g9/2 0.435 0

-588.767 1g7/2 0.355 2.37152e-322

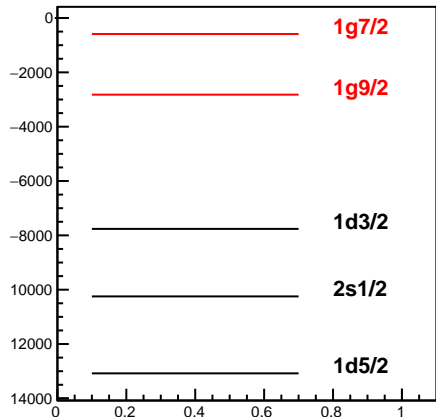
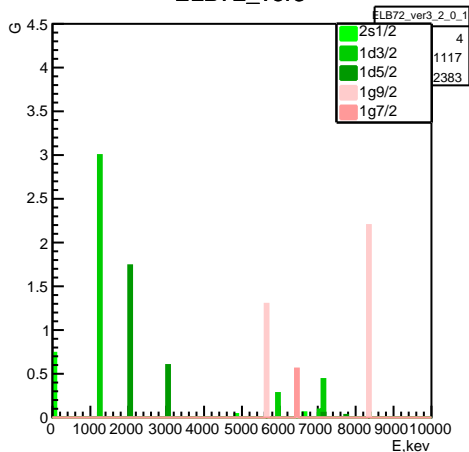
Br69



Penalty function components



ELB72\_ver3



Experiment: Br69 (4) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -11955 ± 497.012 keV

Δ: -4317.38 ± 1090.1 keV

penalty: 0.215453

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13079.5 1d5/2 0.608 1.024

-10247.2 2s1/2 0.3595 0.611

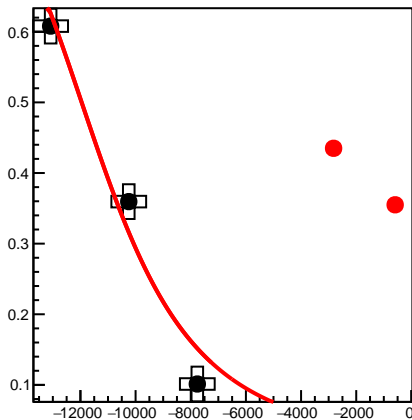
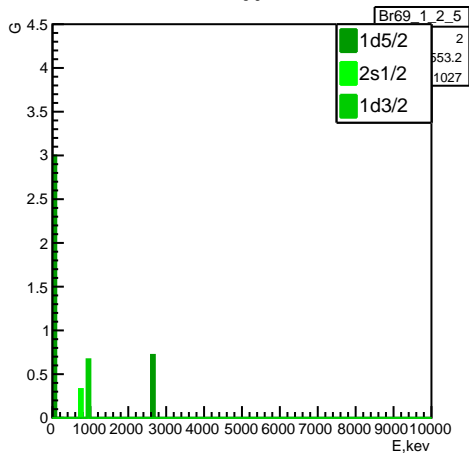
-7761.93 1d3/2 0.10125 1.1325

-2820.87 1g9/2 0.435 5.58294e-322

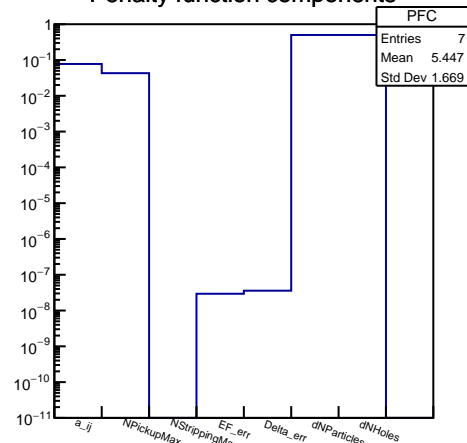
-588.767 1g7/2 0.355 6.92655e-310



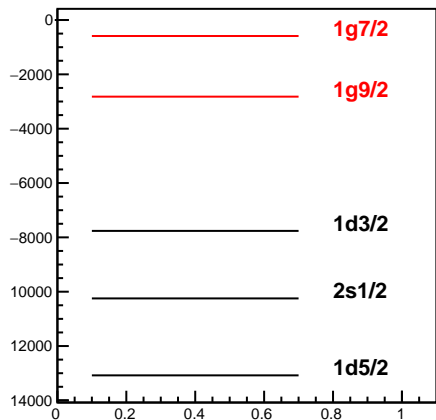
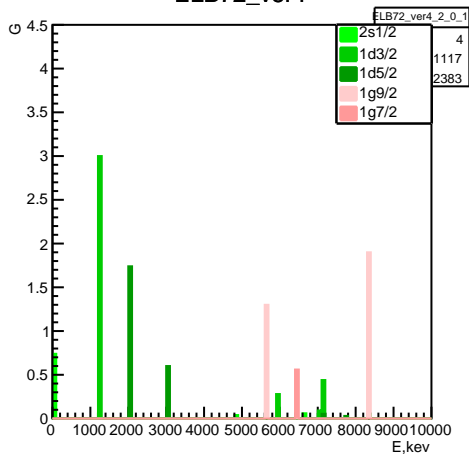
Br69



Penalty function components



ELB72\_ver4



Experiment: Br69 (4) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -11955  $\pm$  497.012 keV $\Delta$ : -4317.38  $\pm$  1090.1 keV

penalty: 0.215453

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13079.5 1d5/2 0.608 1.024

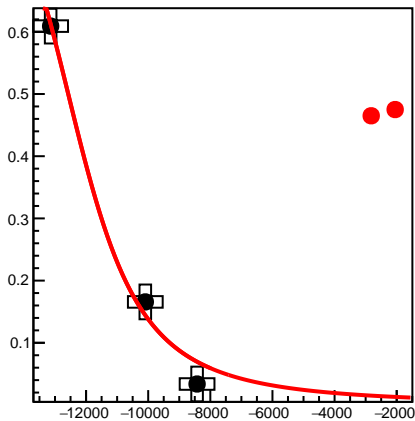
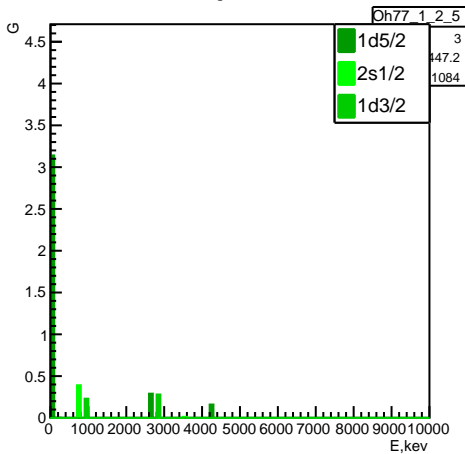
-10247.2 2s1/2 0.3595 0.611

-7761.93 1d3/2 0.10125 1.1325

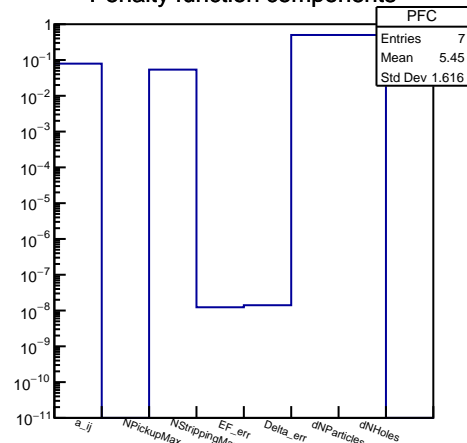
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0775

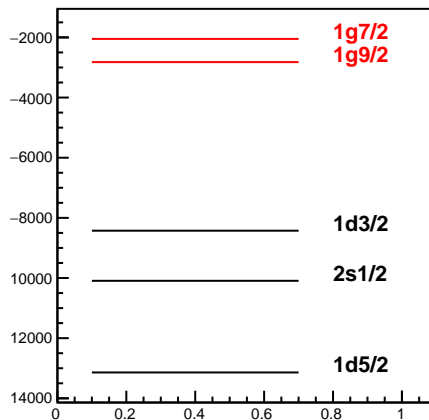
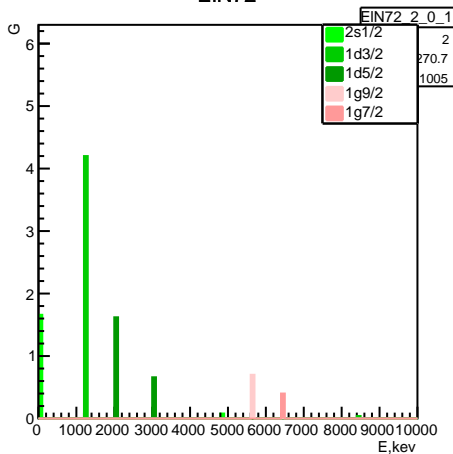
Oh77



Penalty function components



EIN72



Experiment: Oh77 (7) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12574  $\pm$  208.402 keV $\Delta$ : 2451.33  $\pm$  427.987 keV

penalty: 0.217876

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13140.2 1d5/2 0.609167 0.978333

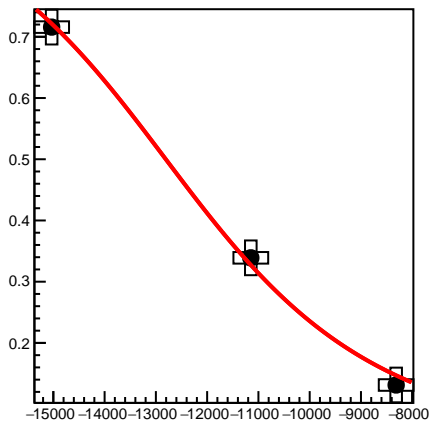
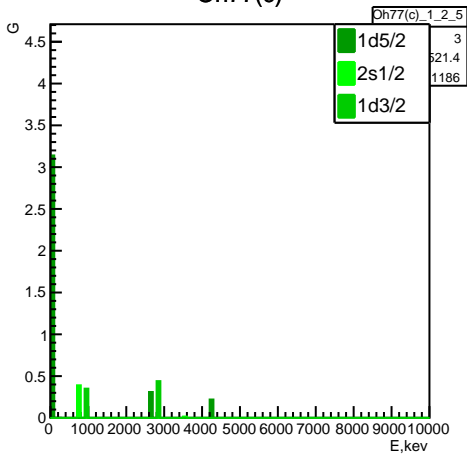
-10092.9 2s1/2 0.16575 1.0715

-8426.15 1d3/2 0.03375 1.1875

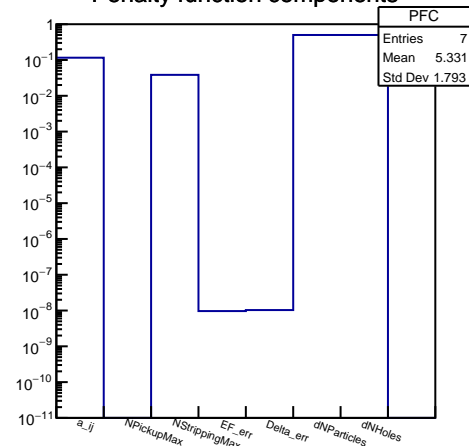
-2820.87 1g9/2 0.465 6.37345e-322

-2049.87 1g7/2 0.475 6.92655e-310

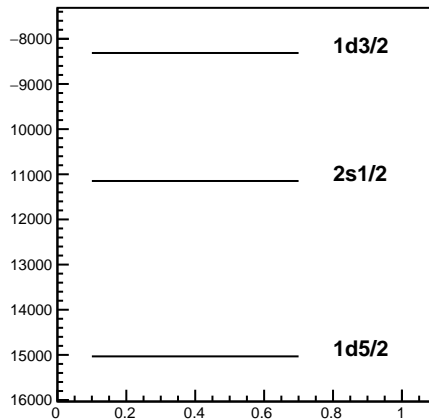
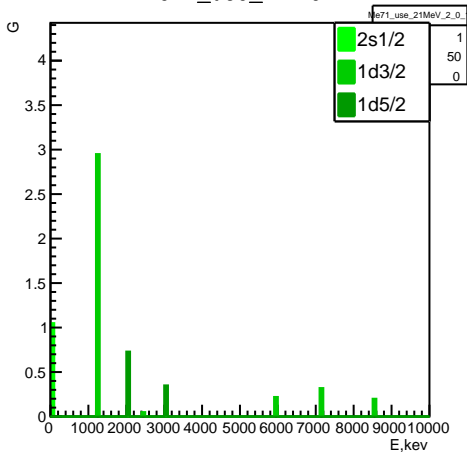
Oh77(c)



Penalty function components



Me71\_use\_21MeV



Experiment: Oh77(c) (7) Me71\_use\_21MeV (1)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12806.6 ± 163.147 keV

Δ: -4505.8 ± 313.602 keV

penalty: 0.222001

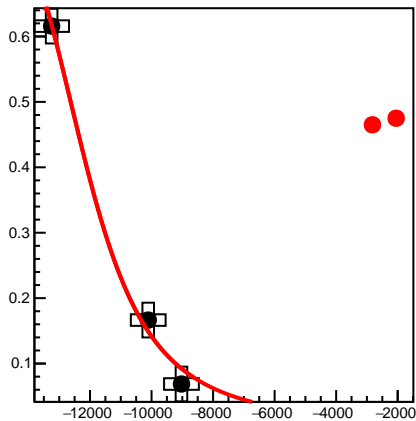
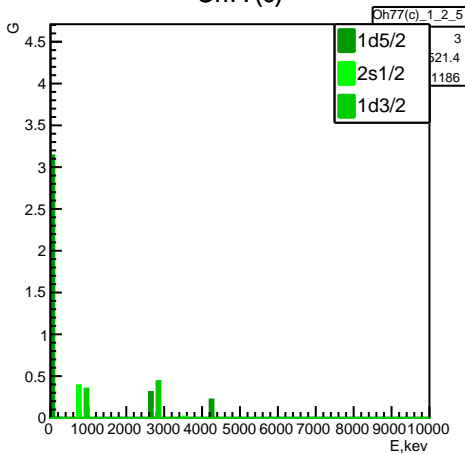
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15032.9 1d5/2 0.715833 0.791667

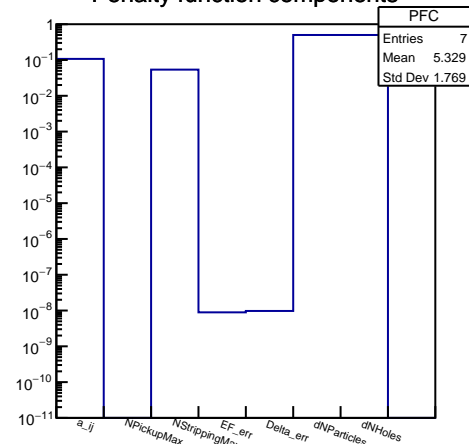
-11148.5 2s1/2 0.339 0.728

-8313.64 1d3/2 0.13125 1.1325

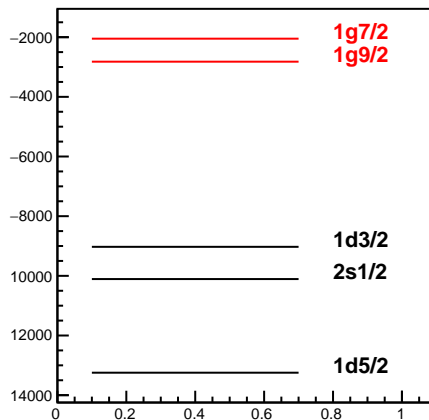
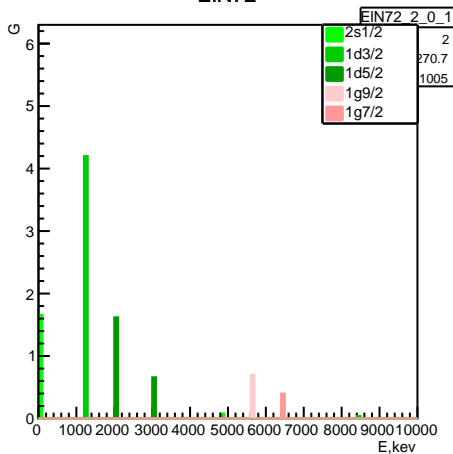
Oh77(c)



Penalty function components



EIN72



Experiment: Oh77(c) (7) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12627.3 \pm 150.351$  keV $\Delta$ :  $-2557.07 \pm 295.898$  keV

penalty: 0.223314

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13246.6 1d5/2 0.615833 0.991667

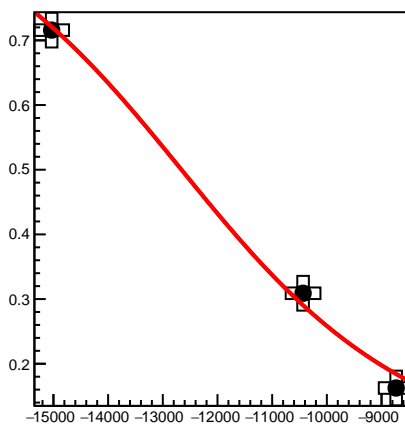
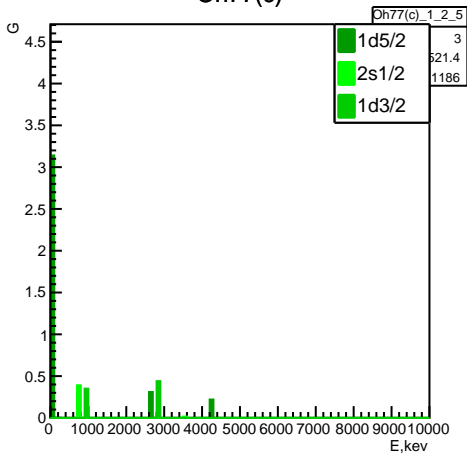
-10107.8 2s1/2 0.1665 1.073

-9027.38 1d3/2 0.06875 1.2575

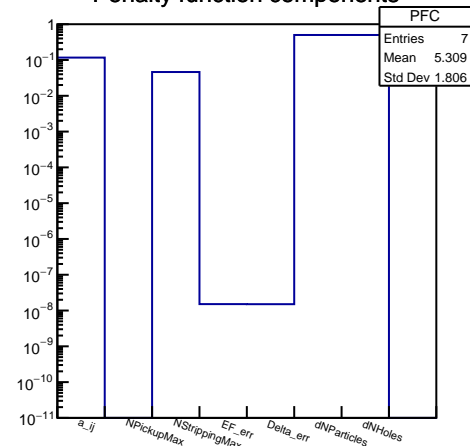
-2820.87 1g9/2 0.465 5.58294e-322

-2049.87 1g7/2 0.475 6.92655e-310

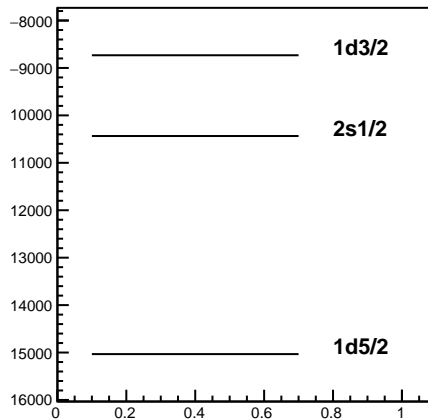
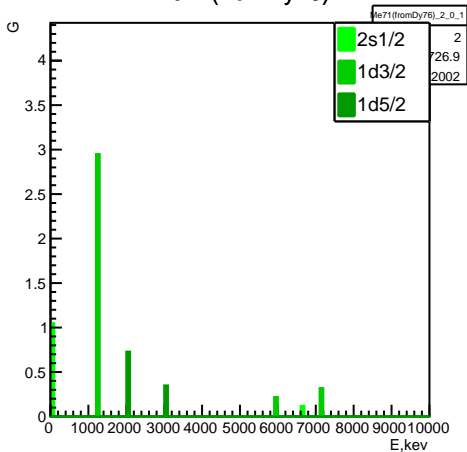
Oh77(c)



Penalty function components



Me71(fromDy76)



Experiment: Oh77(c) (7) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12658.5  $\pm$  255.356 keV $\Delta$ : 4818.01  $\pm$  457.624 keV

penalty: 0.223641

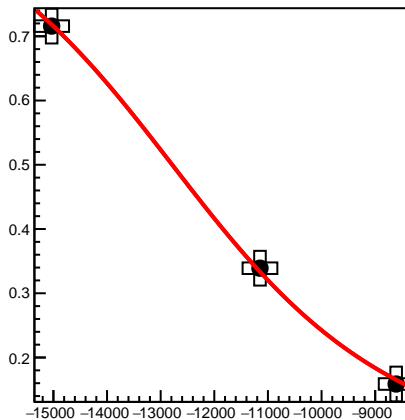
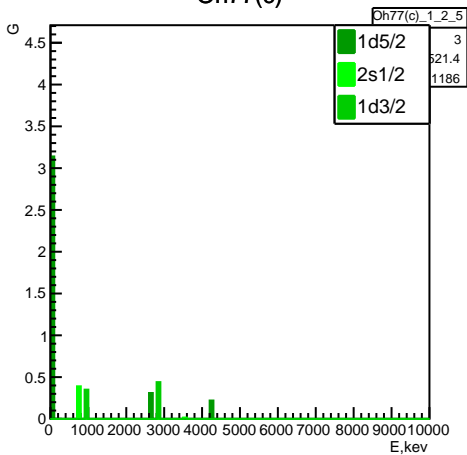
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15032.9 1d5/2 0.715833 0.791667

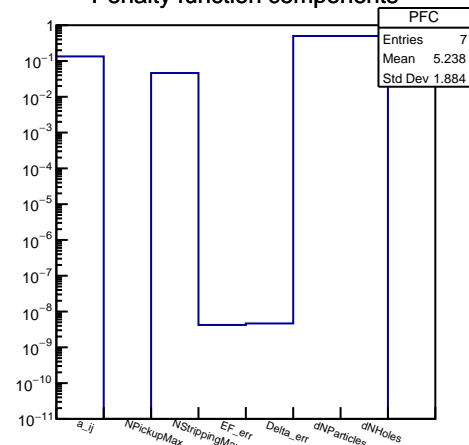
-10434.9 2s1/2 0.309 0.788

-8732.58 1d3/2 0.1625 1.07

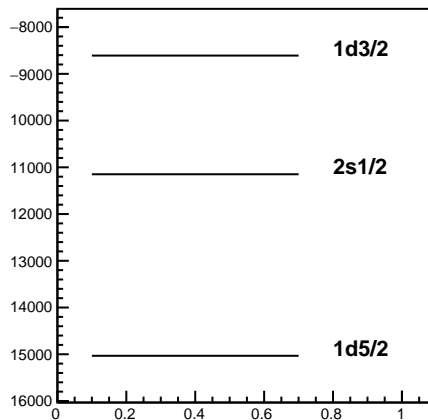
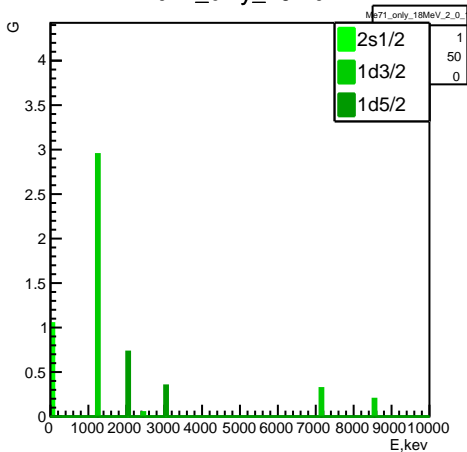
Oh77(c)



Penalty function components



Me71\_only\_18MeV



Experiment: Oh77(c) (7) Me71\_only\_18MeV (1)  
neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12784.6 ± 71.1336 keV

Δ: 4633.2 ± 141.329 keV

penalty: 0.227006

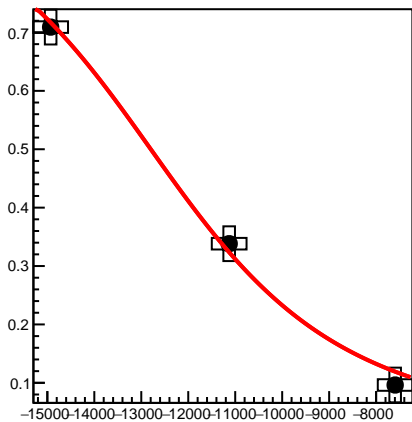
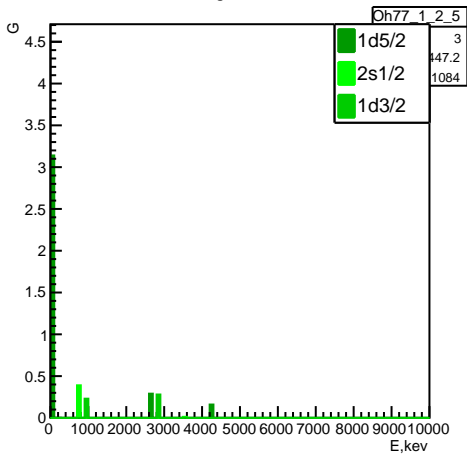
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15032.9 1d5/2 0.715833 0.791667

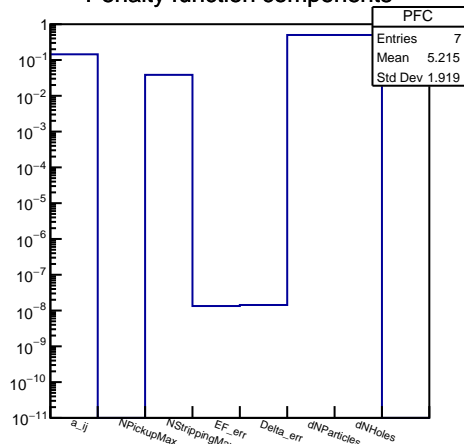
-11148.5 2s1/2 0.339 0.728

-8609.08 1d3/2 0.15875 1.0775

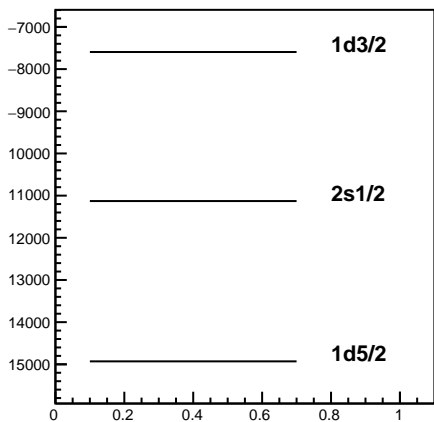
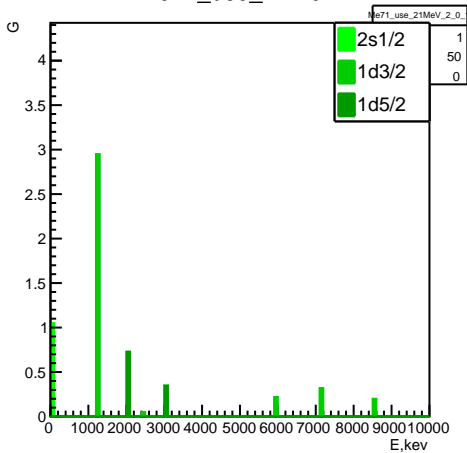
Oh77



Penalty function components

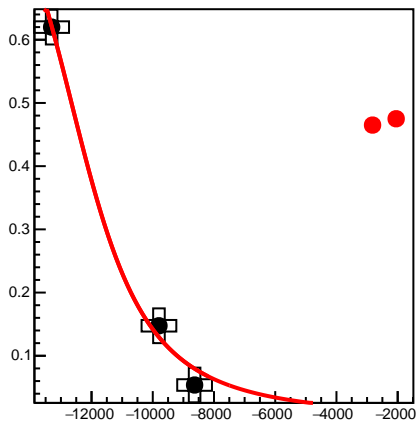
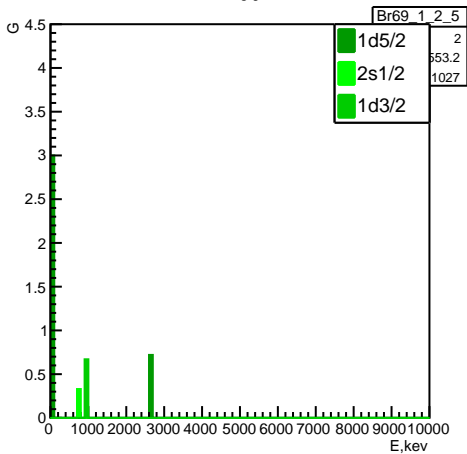


Me71\_use\_21MeV

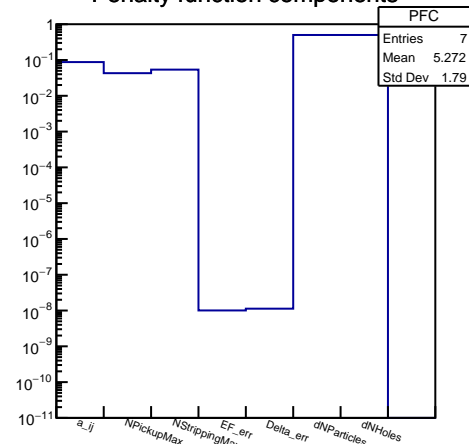


Experiment: Oh77 (7) Me71\_use\_21MeV (8)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.8  
 $E_F$ :  $-12797.4 \pm 225.786$  keV  
 $\Delta$ :  $-4425.21 \pm 434.349$  keV  
 penalty: 0.227439  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -14929.7 1d5/2 0.709167 0.778333  
 -11128.7 2s1/2 0.33825 0.7265  
 -7594.66 1d3/2 0.09625 1.0625

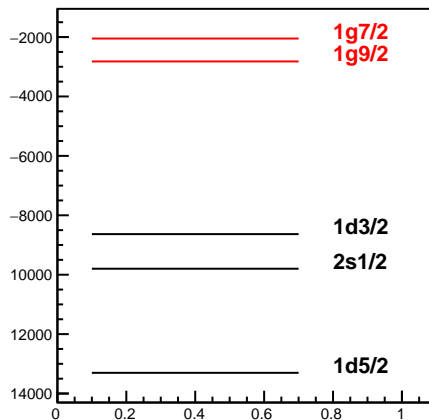
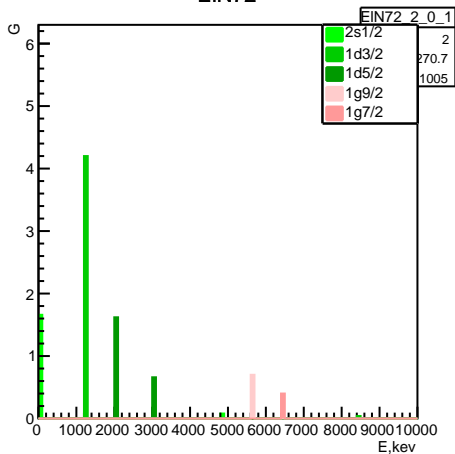
Br69



Penalty function components



EIN72



Experiment: Br69 (4) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12654.7  $\pm$  169.889 keV $\Delta$ : 2588.12  $\pm$  342.773 keV

penalty: 0.227731

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13303 1d5/2 0.62 1

-9798.17 2s1/2 0.1475 1.035

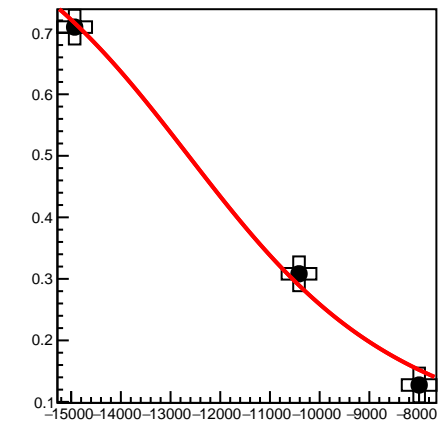
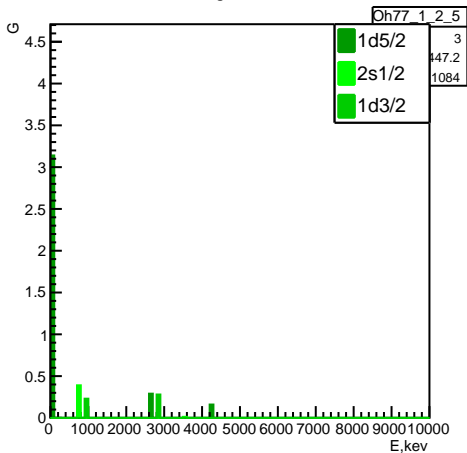
-8633.7 1d3/2 0.05375 1.2275

-2820.87 1g9/2 0.465 4.94066e-324

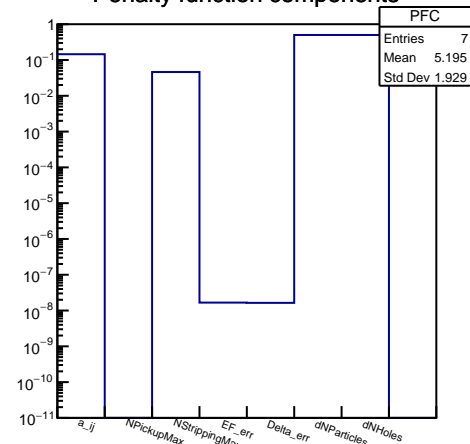
-2049.87 1g7/2 0.475 2.37152e-322



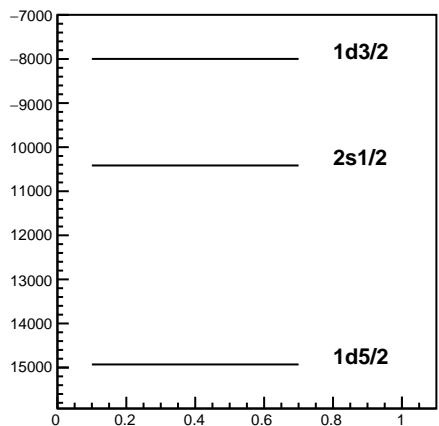
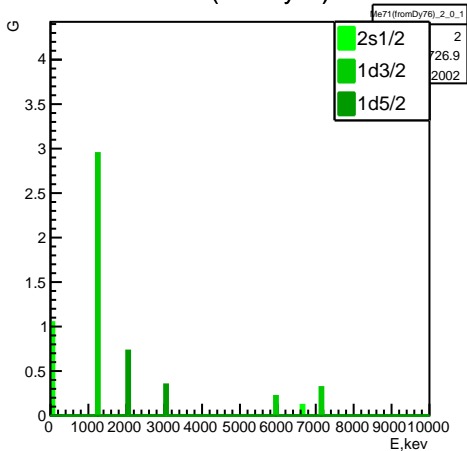
Oh77



Penalty function components

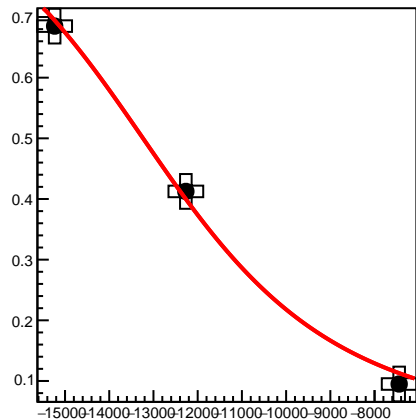
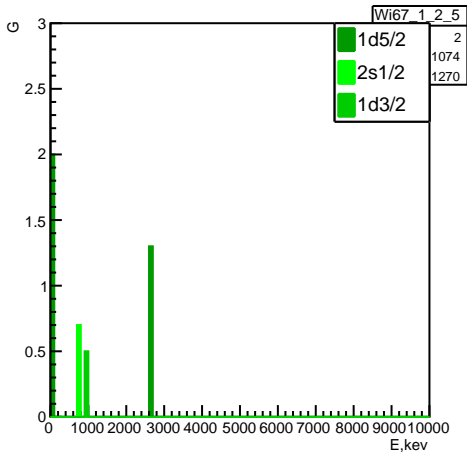


Me71(fromDy76)

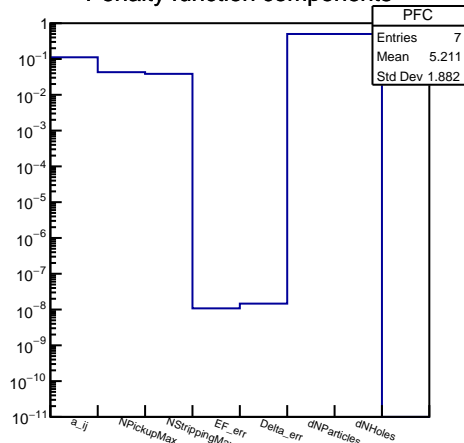


**Experiment: Oh77 (7) Me71(fromDy76) (7)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
**E\_F: -12638  $\pm$  281.394 keV**  
 **$\Delta$ : -4789.3  $\pm$  498.161 keV**  
**penalty: 0.229079**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-14929.7 1d5/2 0.709167 0.778333**  
**-10415.3 2s1/2 0.30825 0.7865**  
**-7997.98 1d3/2 0.1275 1**

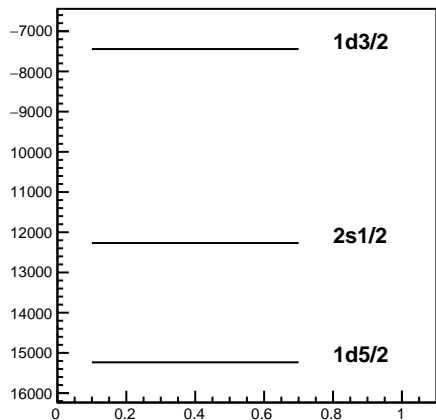
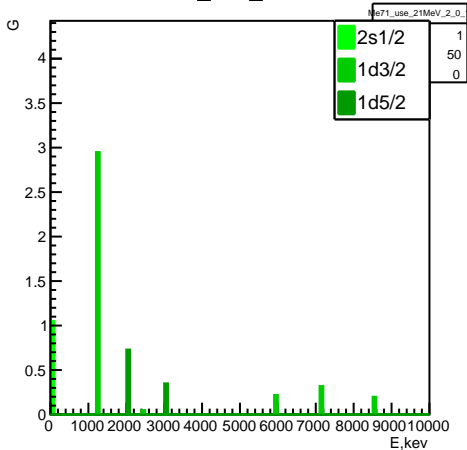
Wi67



Penalty function components

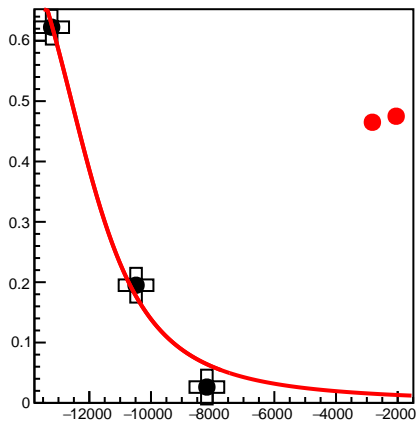
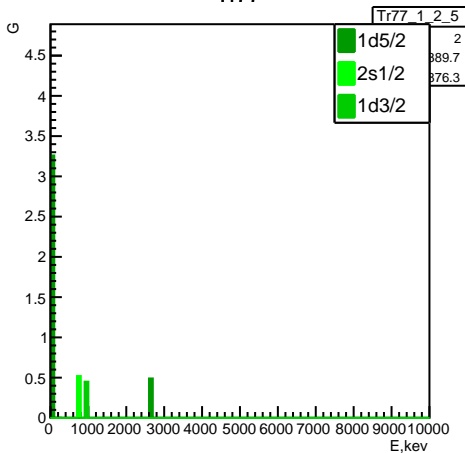


Me71\_use\_21MeV

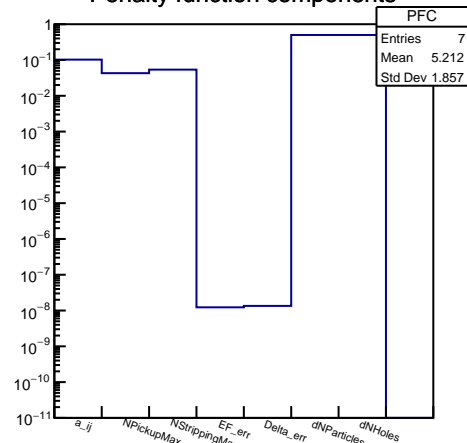


Experiment: Wi67 (4) Me71\_use\_21MeV (8)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.8  
 $E_F$ :  $-13235.9 \pm 182.107$  keV  
 $\Delta$ :  $-4735.19 \pm 444.836$  keV  
 penalty: 0.22942  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -15234.6 1d5/2 0.685 0.73  
 -12267.5 2s1/2 0.4125 0.875  
 -7443.74 1d3/2 0.095 1.06

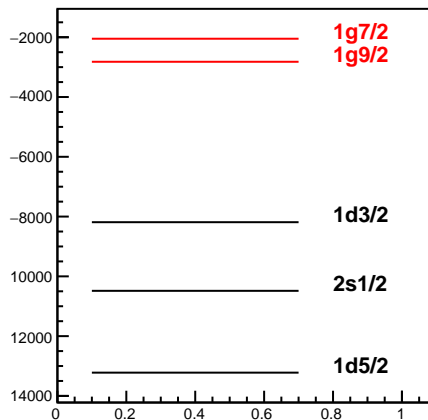
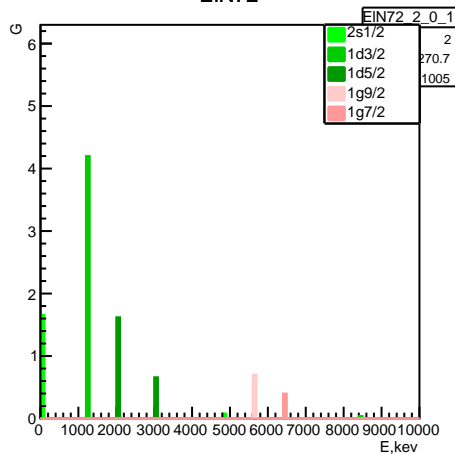
Tr77



Penalty function components



EIN72



Experiment: Tr77 (4) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12575.7  $\pm$  207.622 keV

$\Delta$ : -2466.03  $\pm$  409.791 keV

penalty: 0.230616

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13221.3 1d5/2 0.6225 1.005

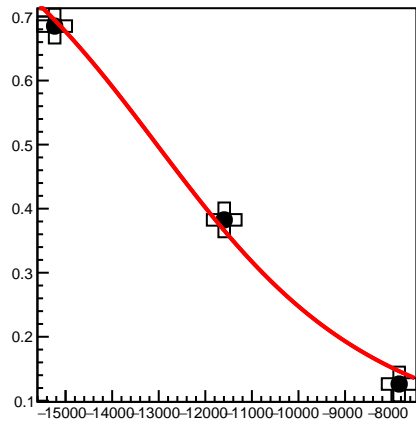
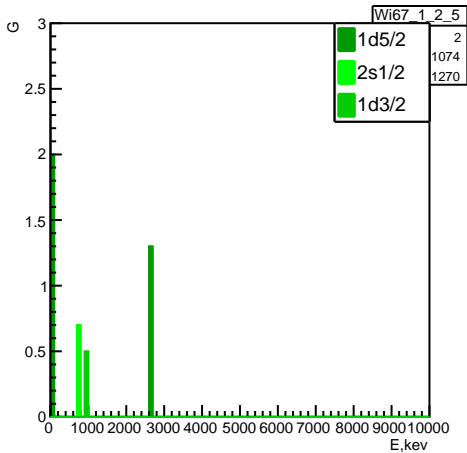
-10484.3 2s1/2 0.195 1.13

-8187.97 1d3/2 0.02625 1.1725

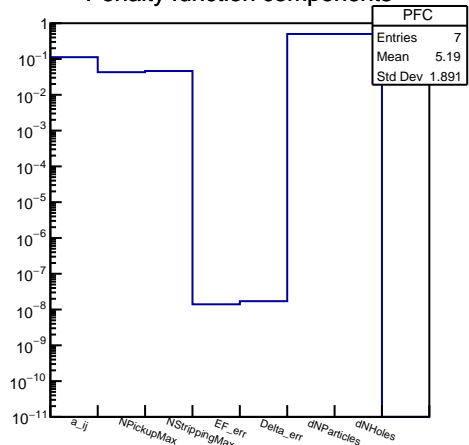
-2820.87 1g9/2 0.465 4.94066e-324

-2049.87 1g7/2 0.475 2.37152e-322

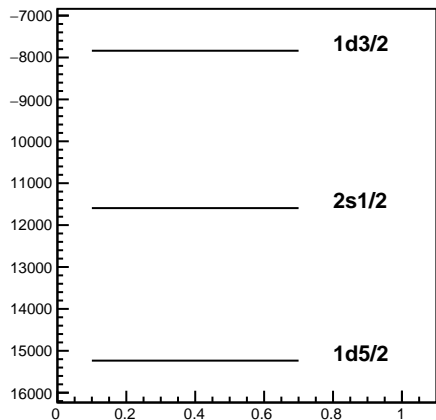
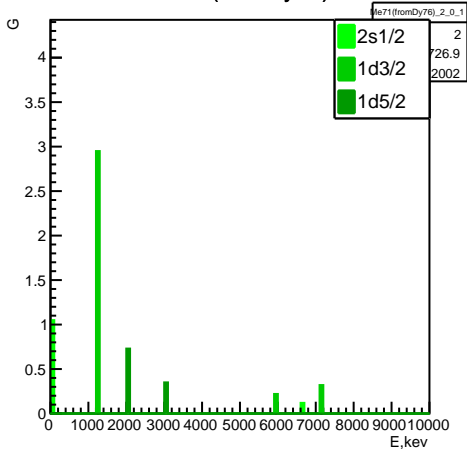
Wi67



Penalty function components

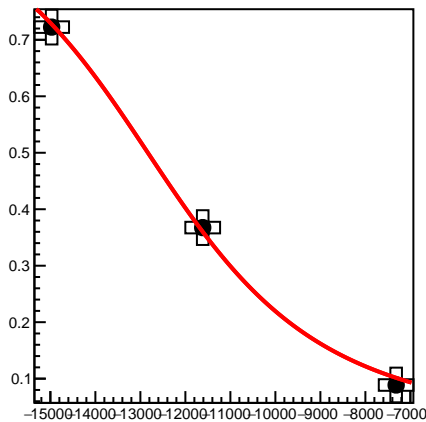
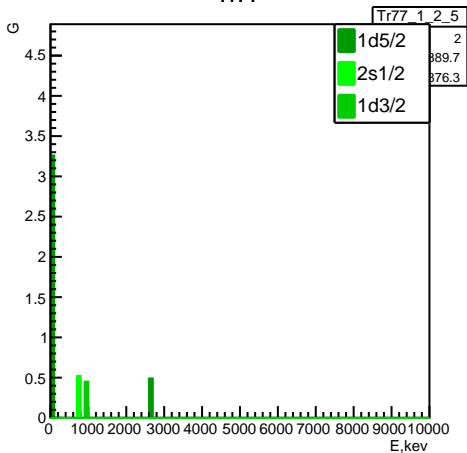


Me71(fromDy76)

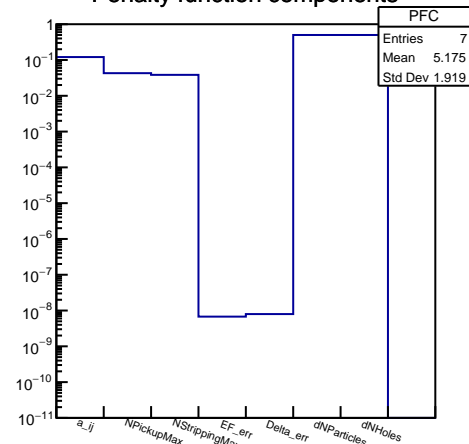


Experiment: Wi67 (4) Me71(fromDy76) (7)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 E\_F: -13040.5  $\pm$  236.376 keV  
 $\Delta$ : 5196.74  $\pm$  520.45 keV  
 penalty: 0.23106  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -15234.6 1d5/2 0.685 0.73  
 -11594.3 2s1/2 0.3825 0.935  
 -7838.62 1d3/2 0.12625 0.9975

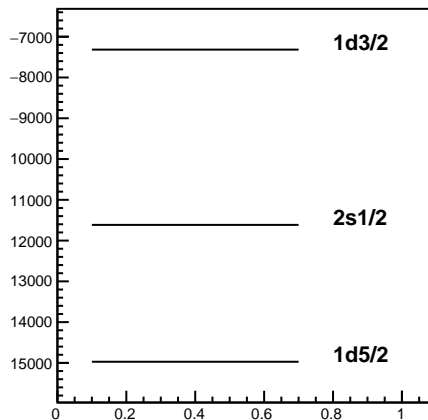
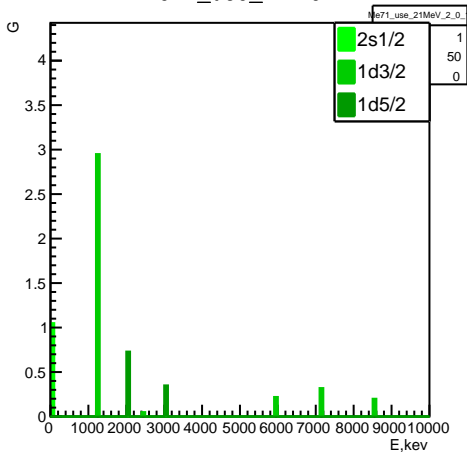
Tr77



Penalty function components

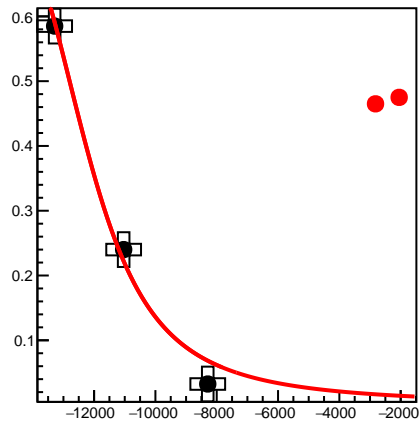
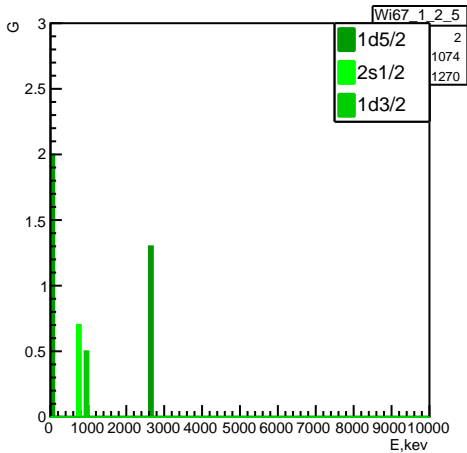


Me71\_use\_21MeV

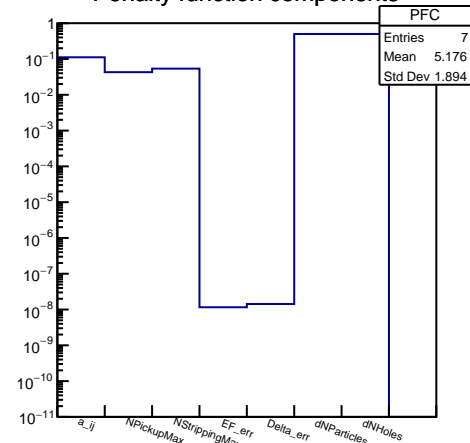


**Experiment: Tr77 (4) Me71\_use\_21MeV (8)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
**E\_F:  $-12833.3 \pm 114.106$  keV**  
 **$\Delta$ :  $4180.34 \pm 242.208$  keV**  
**penalty: 0.231183**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-14971.7 1d5/2 0.7225 0.805**  
**-11614.9 2s1/2 0.3675 0.785**  
**-7316.14 1d3/2 0.08875 1.0475**

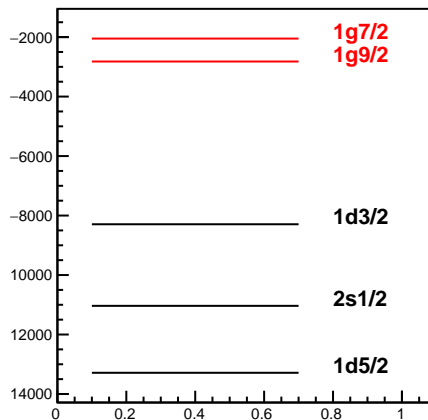
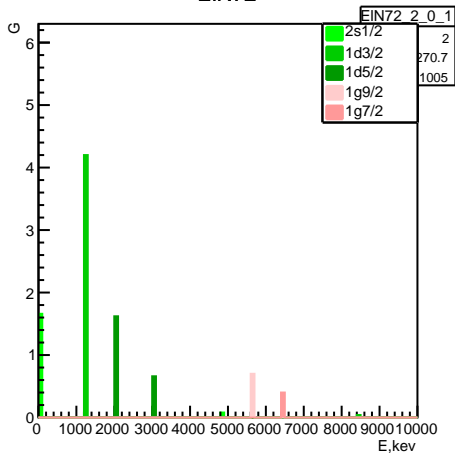
Wi67



Penalty function components



EIN72



Experiment: Wi67 (4) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12798.7 \pm 195.56$  keV $\Delta: -2637.09 \pm 433.998$  keV

penalty: 0.232379

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13286.5 1d5/2 0.585 0.93

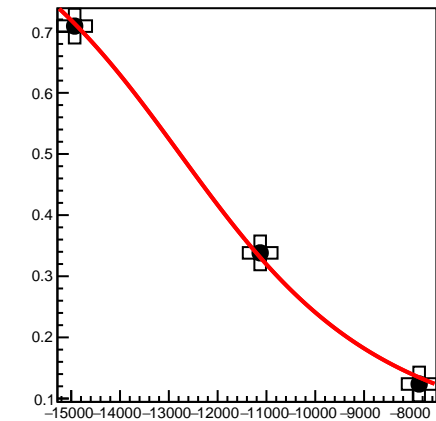
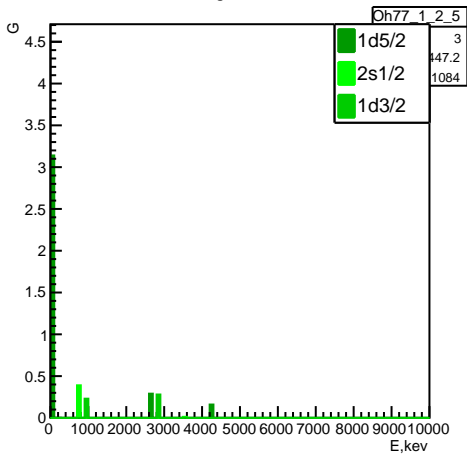
-11035.8 2s1/2 0.24 1.22

-8292.9 1d3/2 0.0325 1.185

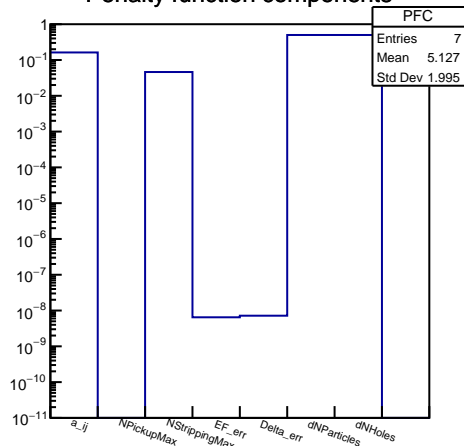
-2820.87 1g9/2 0.465 1.60074e-317

-2049.87 1g7/2 0.475 2.37152e-322

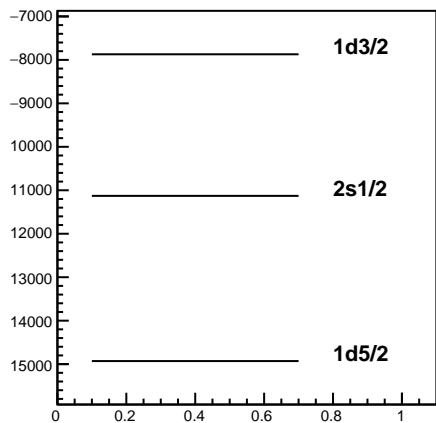
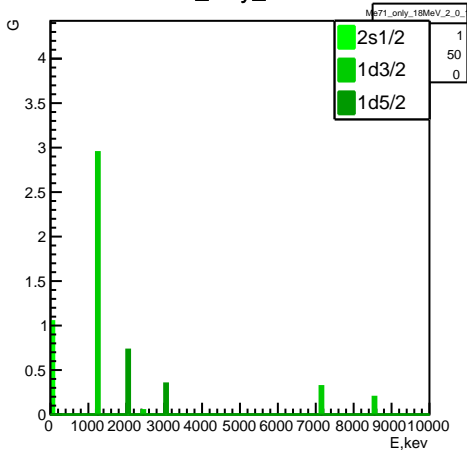
Oh77



Penalty function components



Me71\_only\_18MeV



Experiment: Oh77 (7) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F:  $-12773.1 \pm 109.348$  keV

$\Delta$ :  $4576.57 \pm 218.128$  keV

penalty: 0.232444

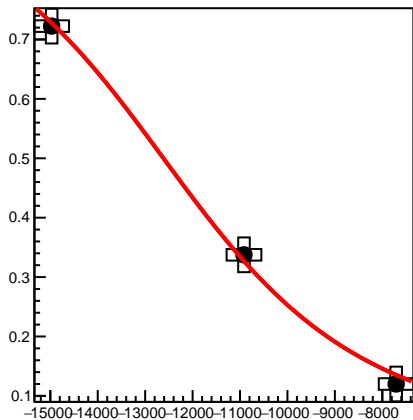
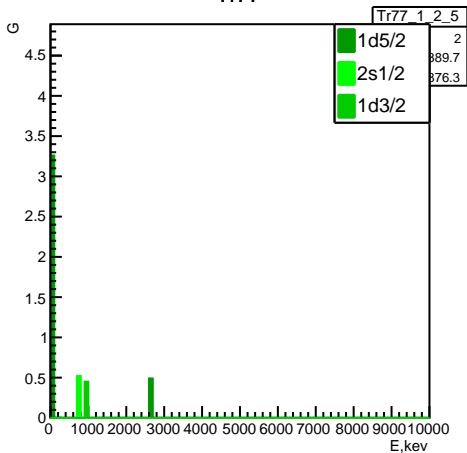
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-14929.7 1d5/2 0.709167 0.778333

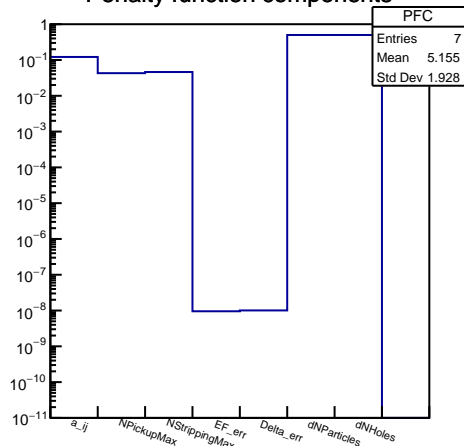
-11128.7 2s1/2 0.33825 0.7265

-7871.37 1d3/2 0.12375 1.0075

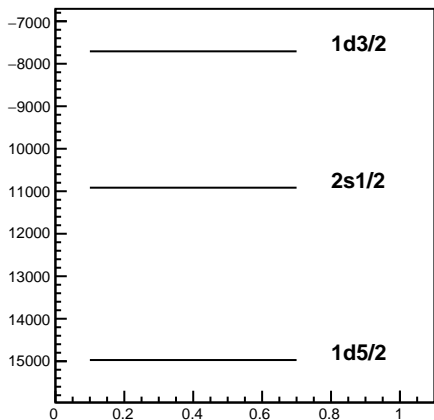
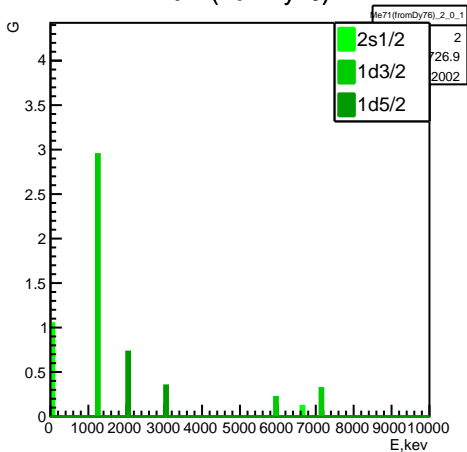
Tr77



Penalty function components



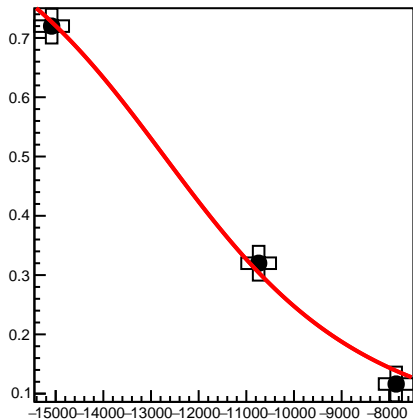
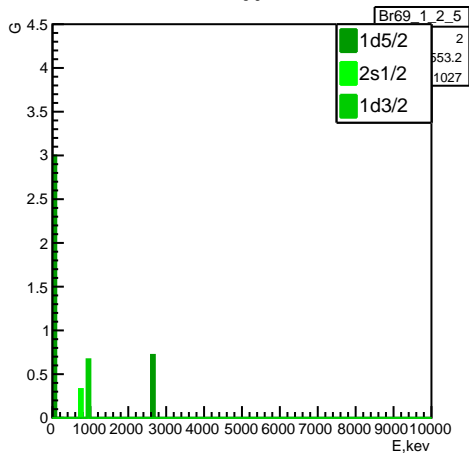
Me71(fromDy76)



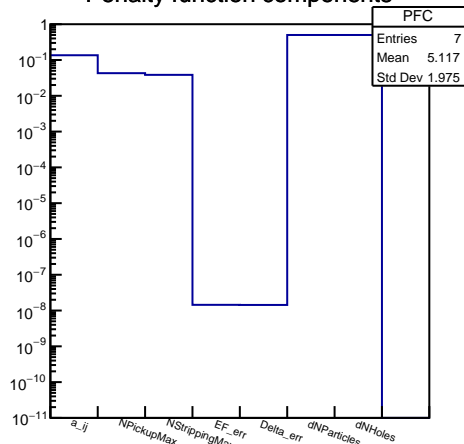
Experiment: Tr77 (4) Me71(fromDy76) (7)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 E\_F: -12615  $\pm$  161.076 keV  
 $\Delta$ : -4603.25  $\pm$  306.229 keV  
 penalty: 0.232823  
 SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$   
 -14971.7 1d5/2 0.7225 0.805  
 -10916.4 2s1/2 0.3375 0.845  
 -7707.94 1d3/2 0.12 0.985



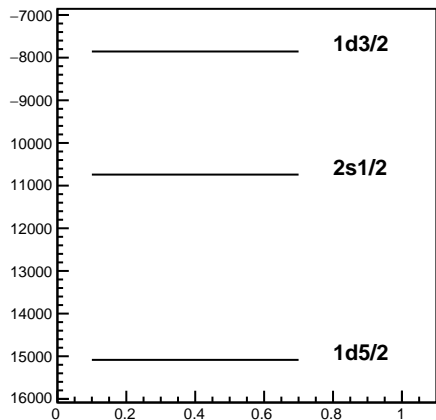
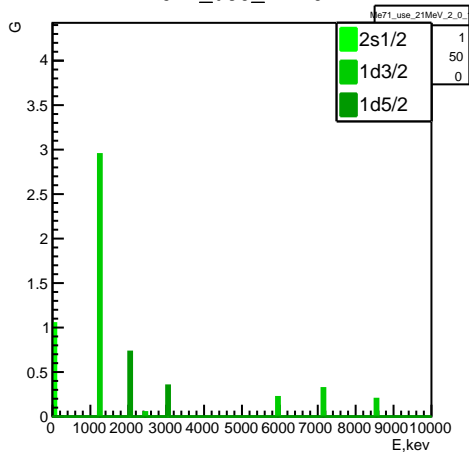
Br69



Penalty function components



Me71\_use\_21MeV



Experiment: Br69 (4) Me71\_use\_21MeV (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12717.5  $\pm$  243.623 keV

$\Delta$ : 4645.81  $\pm$  435.642 keV

penalty: 0.234068

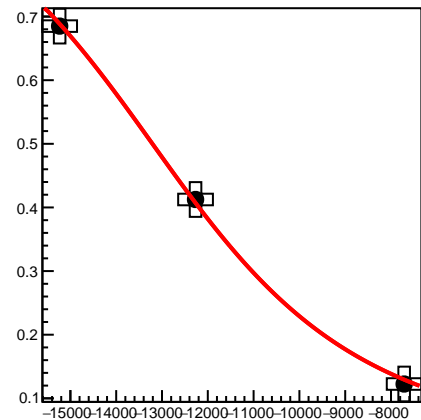
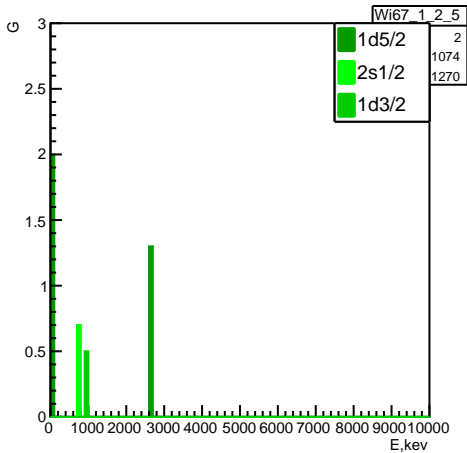
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15084.8 1d5/2 0.72 0.8

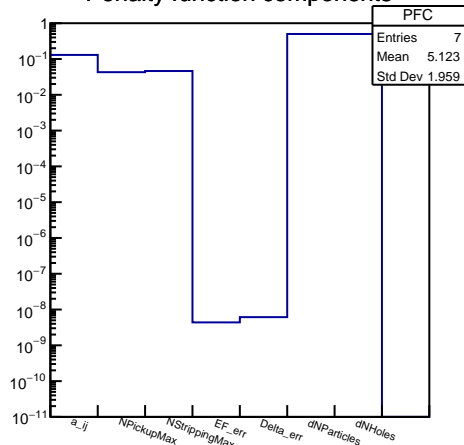
-10741.4 2s1/2 0.32 0.69

-7855.91 1d3/2 0.11625 1.1025

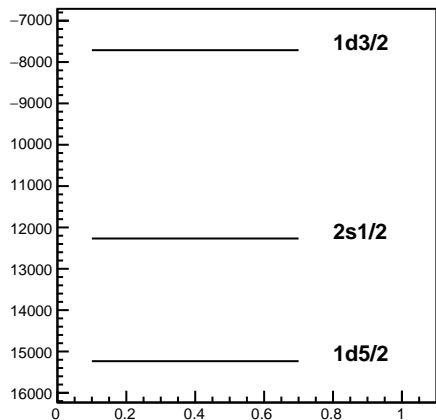
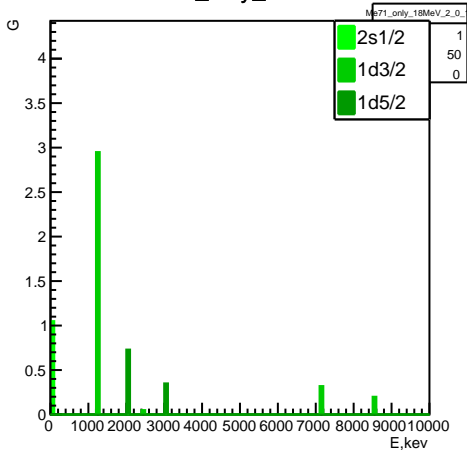
Wi67



Penalty function components



Me71\_only\_18MeV



Experiment: Wi67 (4) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -13208.6  $\pm$  73.8625 keV

$\Delta$ : 4977.08  $\pm$  186.409 keV

penalty: 0.234425

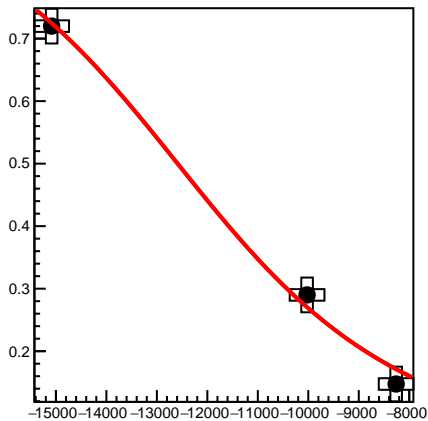
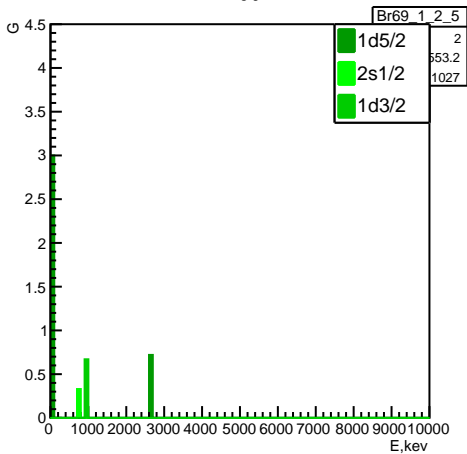
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15234.6 1d5/2 0.685 0.73

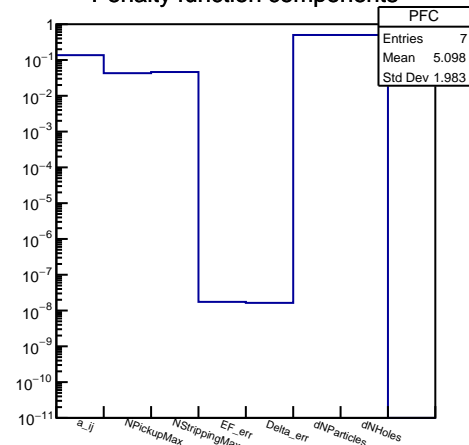
-12267.5 2s1/2 0.4125 0.875

-7712.87 1d3/2 0.1225 1.005

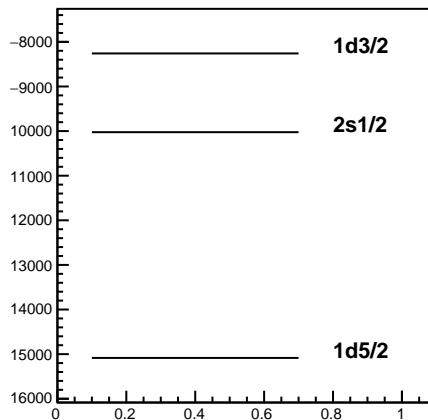
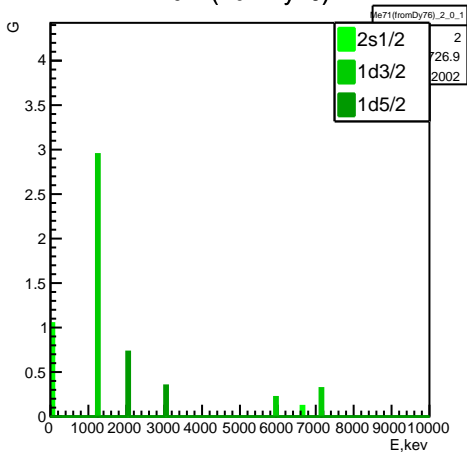
Br69



Penalty function components



Me71(fromDy76)



Experiment: Br69 (4) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12588.8  $\pm$  294.784 keV $\Delta$ : -4961.08  $\pm$  497.603 keV

penalty: 0.235707

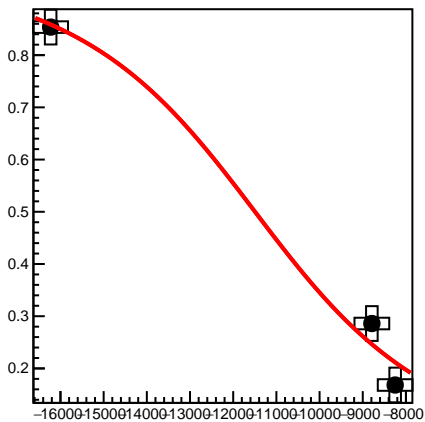
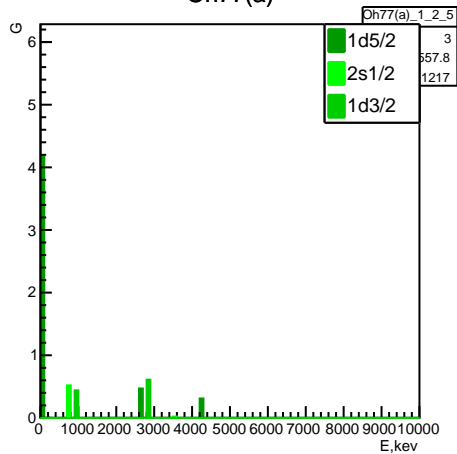
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15084.8 1d5/2 0.72 0.8

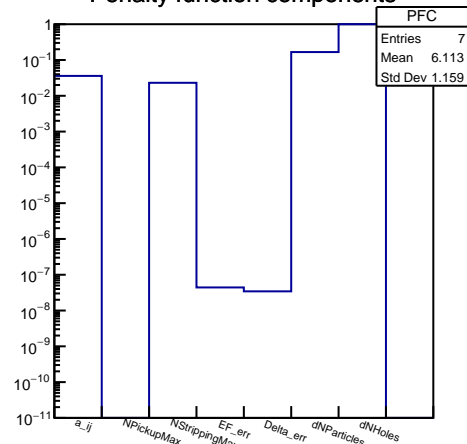
-10024.3 2s1/2 0.29 0.75

-8259.43 1d3/2 0.1475 1.04

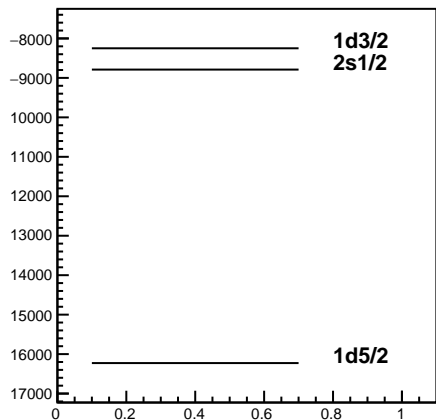
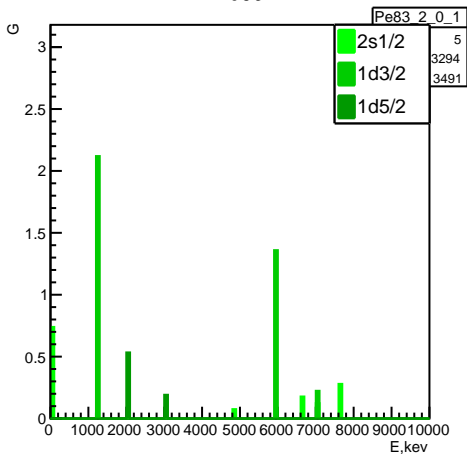
Oh77(a)



Penalty function components



Pe83



Experiment: Oh77(a) (7) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -11494.4  $\pm$  745.987 keV $\Delta$ : 4596.69  $\pm$  1045.28 keV

penalty: 0.235709

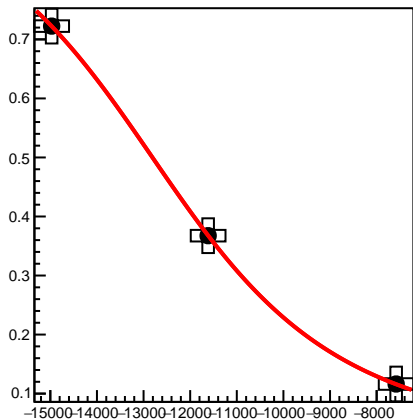
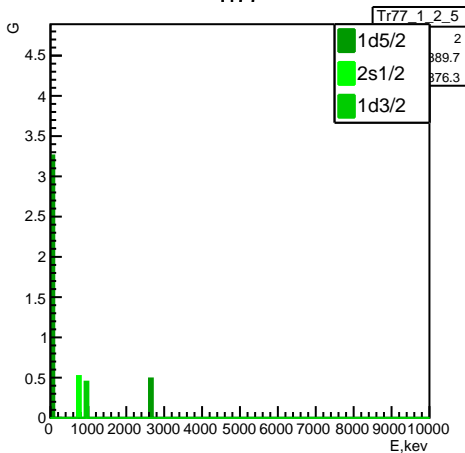
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-16227.3 1d5/2 0.853667 0.949333

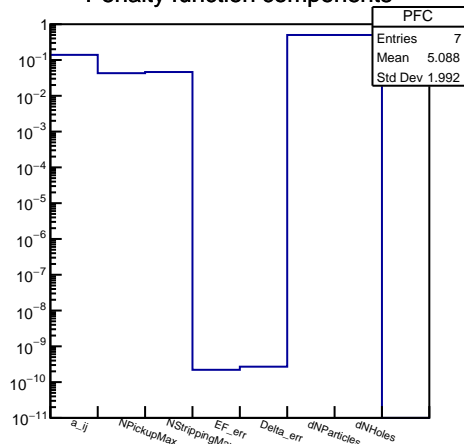
-8789.27 2s1/2 0.286 0.97

-8249.75 1d3/2 0.16825 1.1885

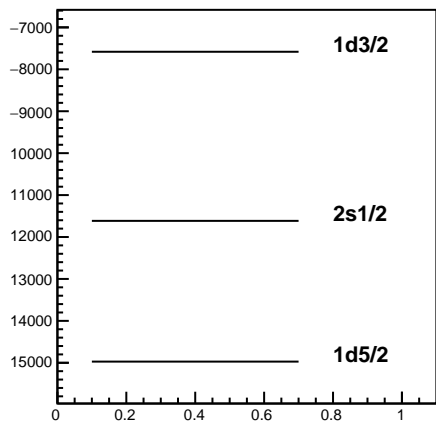
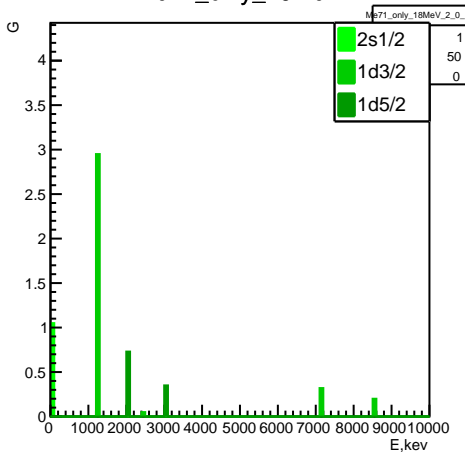
Tr77



Penalty function components



Me71\_only\_18MeV



Experiment: Tr77 (4) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

$E_F$ :  $-12809.4 \pm 3.72686$  keV

$\Delta$ :  $-4355.19 \pm 8.20771$  keV

penalty: 0.236188

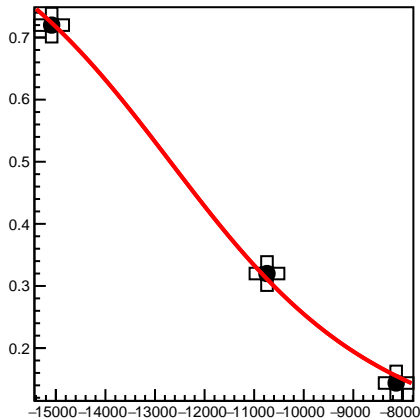
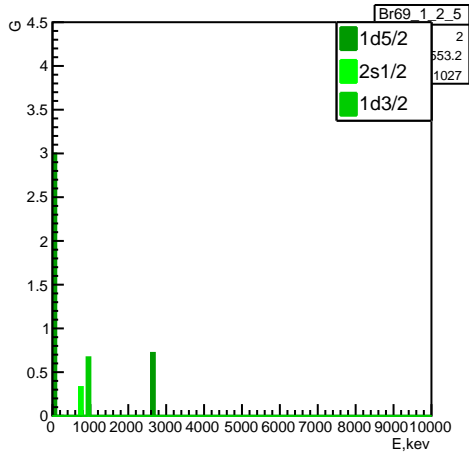
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-14971.7 1d5/2 0.7225 0.805

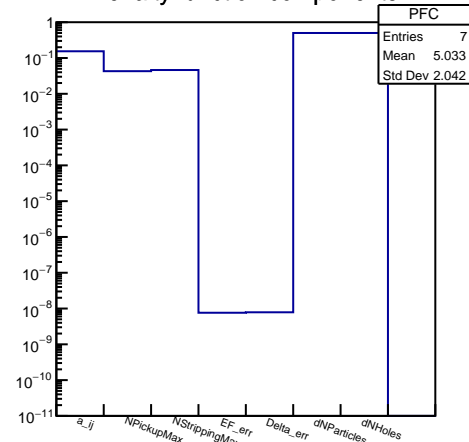
-11614.9 2s1/2 0.3675 0.785

-7581.6 1d3/2 0.11625 0.9925

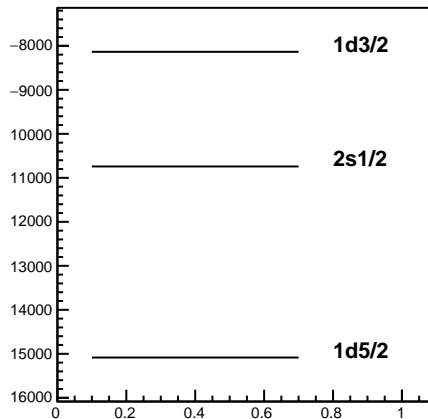
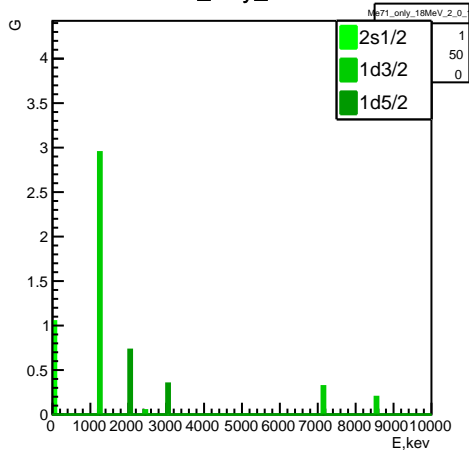
Br69



Penalty function components



Me71\_only\_18MeV



Experiment: Br69 (4) Me71\_only\_18MeV (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12692 ± 128.776 keV

Δ: -4784.6 ± 238.945 keV

penalty: 0.239073

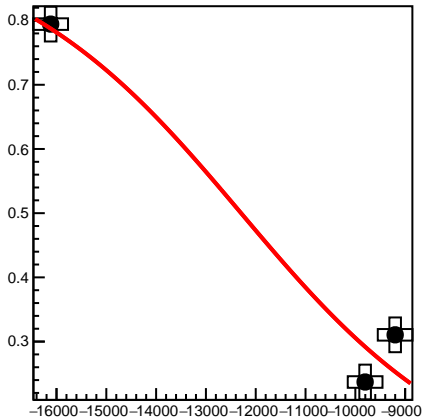
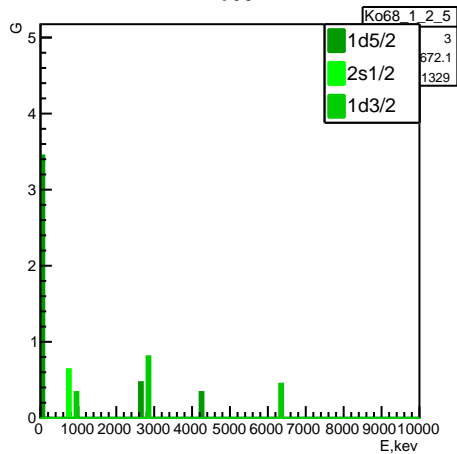
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15084.8 1d5/2 0.72 0.8

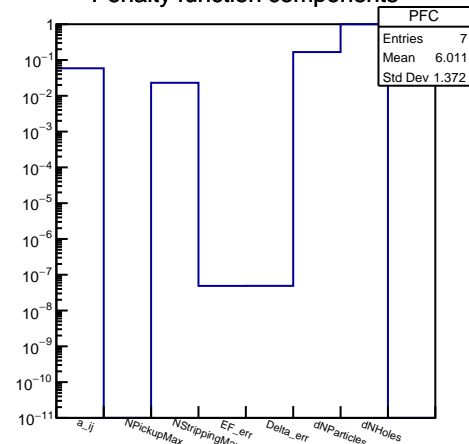
-10741.4 2s1/2 0.32 0.69

-8135.77 1d3/2 0.14375 1.0475

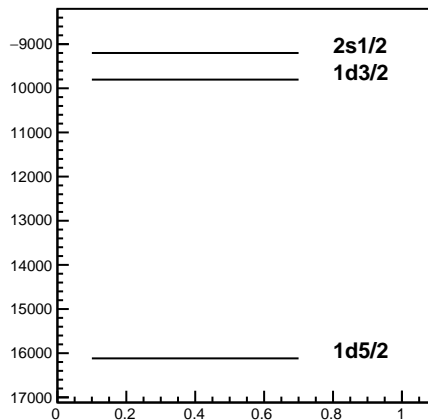
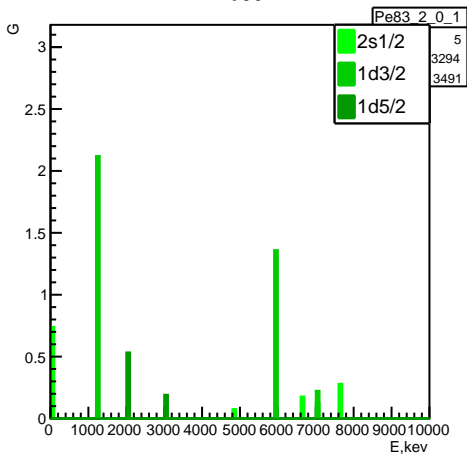
Ko68



Penalty function components



Pe83



Experiment: Ko68 (7) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12293.4 \pm 823.196$  keV $\Delta: -5439.34 \pm 1487$  keV

penalty: 0.240079

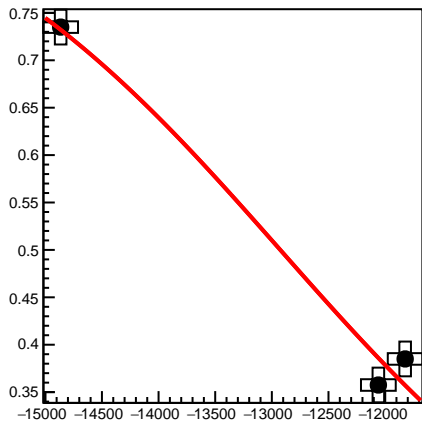
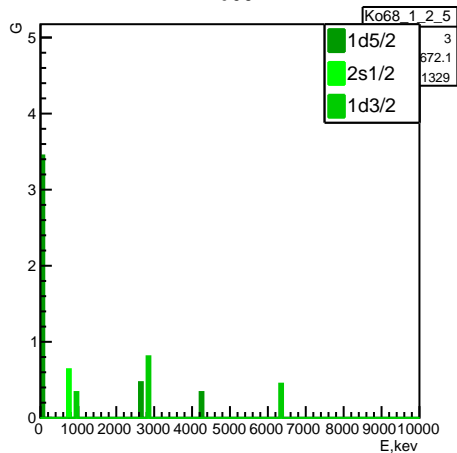
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-16117.7 1d5/2 0.7945 0.831

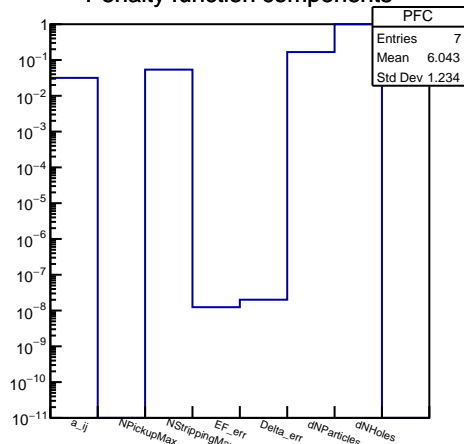
-9200.44 2s1/2 0.3105 1.019

-9803.55 1d3/2 0.237 1.326

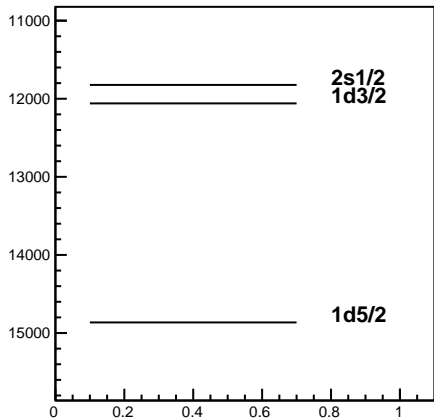
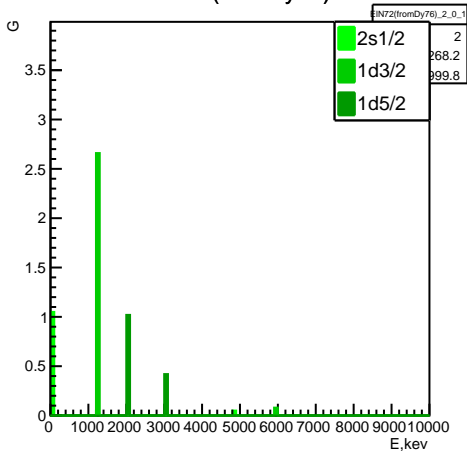
Ko68



Penalty function components



EIN72(fromDy76)



Experiment: Ko68 (7) EIN72(fromDy76) (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12925.2 \pm 209.381 \text{ keV}$  $\Delta: 3697.72 \pm 610.168 \text{ keV}$ 

penalty: 0.240804

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

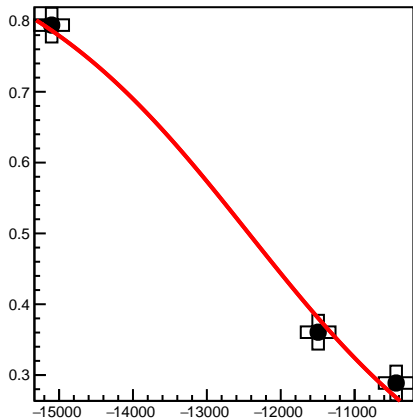
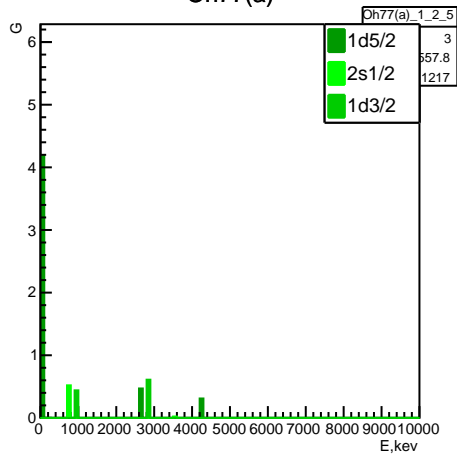
-14864.4 1d5/2 0.735 0.95

-11823.1 2s1/2 0.385 0.87

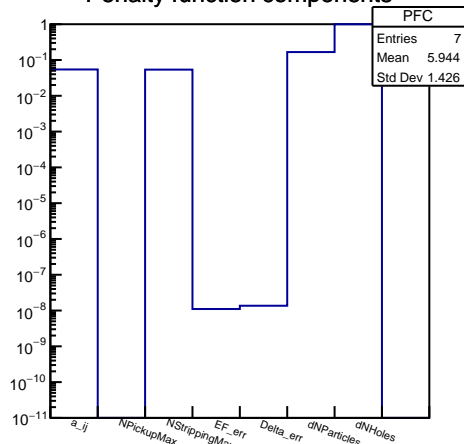
-12059.7 1d3/2 0.3575 1.085



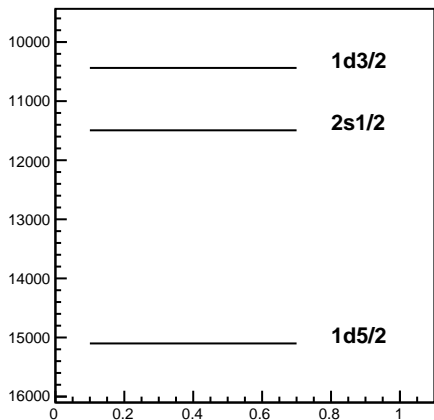
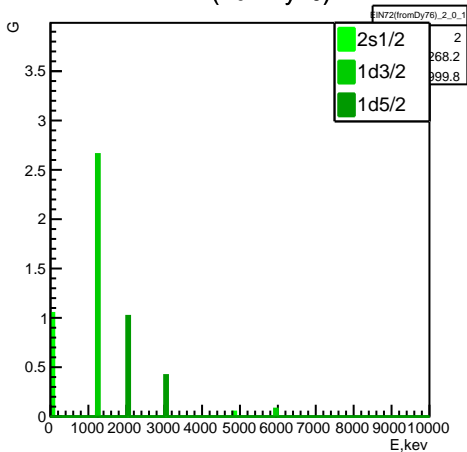
Oh77(a)



Penalty function components



EIN72(fromDy76)



Experiment: Oh77(a) (7) EIN72(fromDy76) (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12433.2  $\pm$  186.22 keV $\Delta$ : 3814.39  $\pm$  414.001 keV

penalty: 0.245173

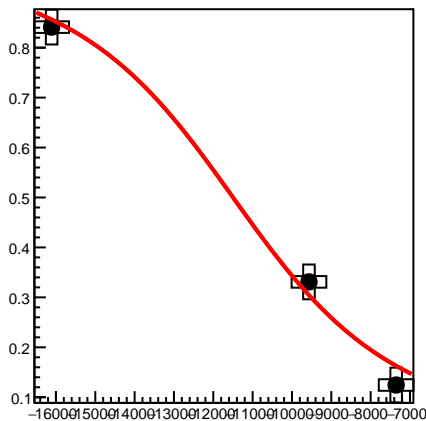
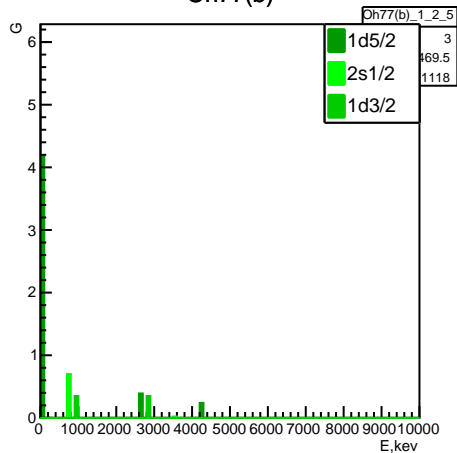
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15100.7 1d5/2 0.794167 1.06833

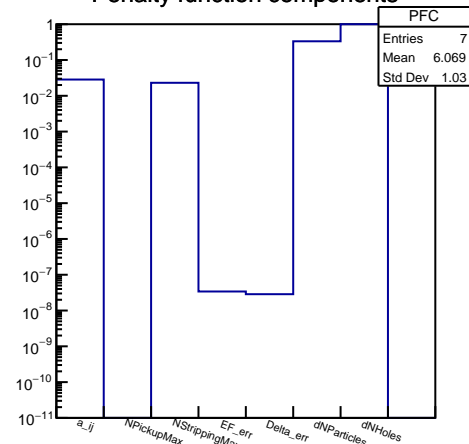
-11493.9 2s1/2 0.3605 0.821

-10438 1d3/2 0.28875 0.9475

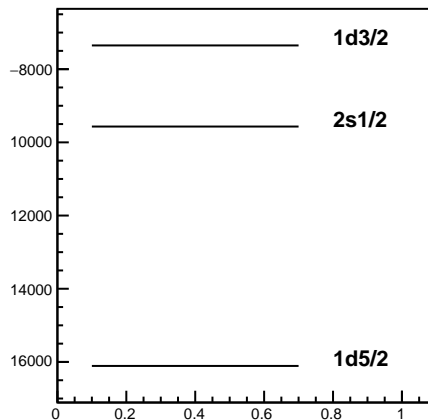
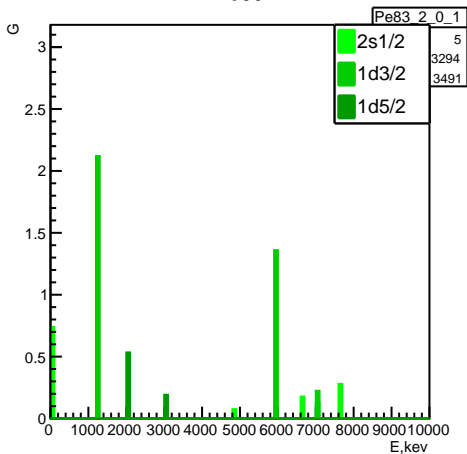
Oh77(b)



Penalty function components



Pe83



Experiment: Oh77(b) (7) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -11497.3  $\pm$  574.908 keV $\Delta$ : 4541.7  $\pm$  870.173 keV

penalty: 0.266318

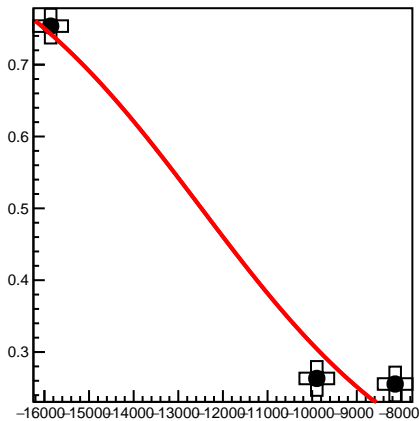
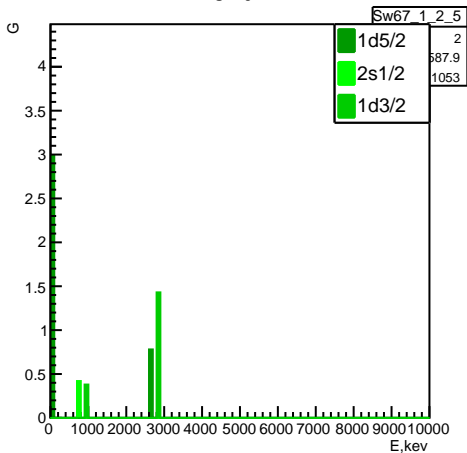
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-16109.3 1d5/2 0.841167 0.924333

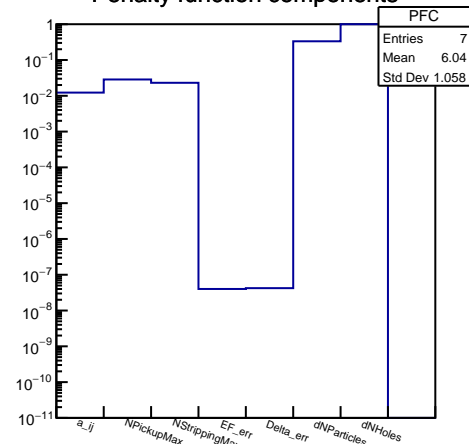
-9567.87 2s1/2 0.331 1.06

-7351.36 1d3/2 0.1245 1.101

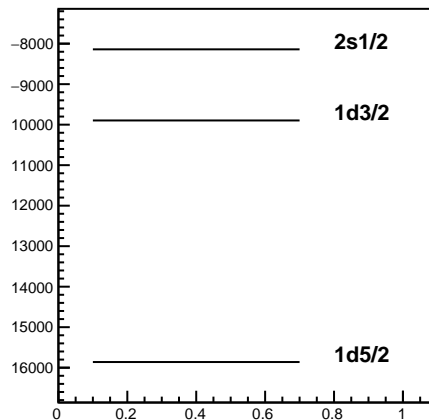
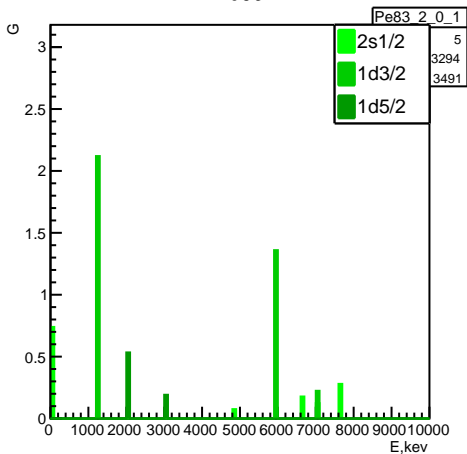
Sw67



Penalty function components



Pe83



Experiment: Sw67 (5) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12481.6 \pm 676.324$  keV $\Delta: -6082.46 \pm 1283.74$  keV

penalty: 0.268704

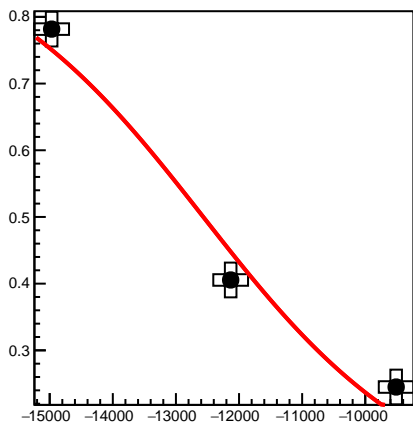
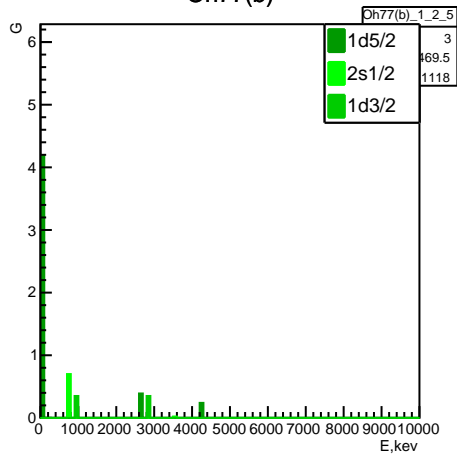
SPE,keV nIj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15860.2 1d5/2 0.753667 0.749333

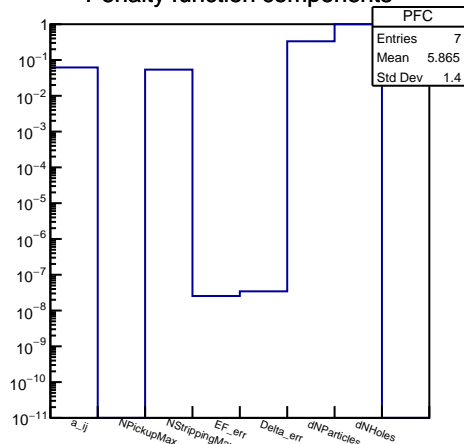
-8140.49 2s1/2 0.2555 0.909

-9896.26 1d3/2 0.26325 1.3785

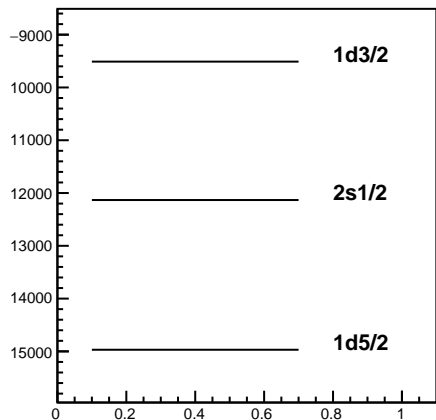
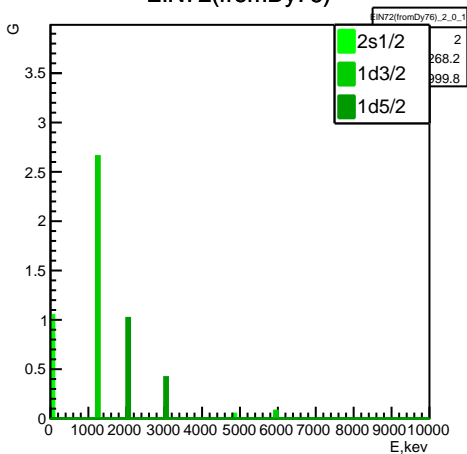
Oh77(b)



Penalty function components



EIN72(fromDy76)



Experiment: Oh77(b) (7) EIN72(fromDy76) (6)  
neutron transfer

n separation energy A:17178.6, A+1: 8472.8

E\_F:  $-12566.3 \pm 429.779$  keV

$\Delta$ :  $4146.71 \pm 1045.23$  keV

penalty: 0.278667

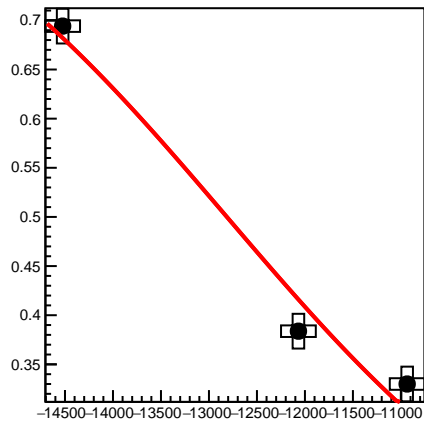
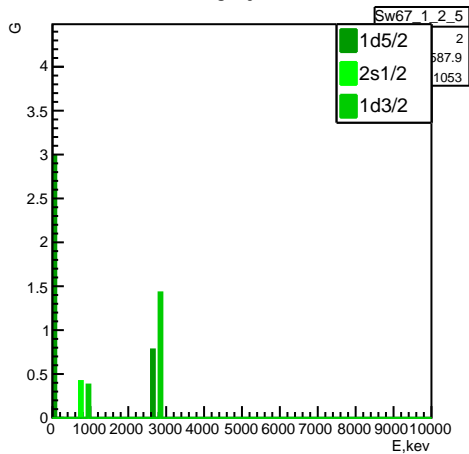
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-14969.1 1d5/2 0.781667 1.04333

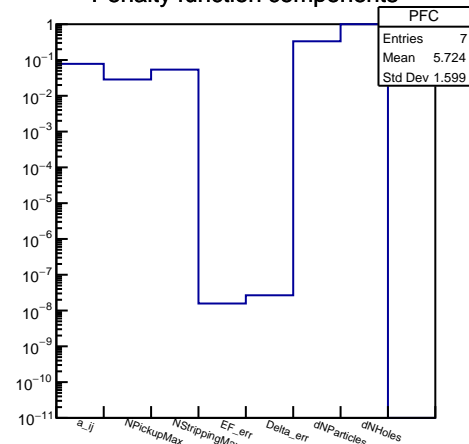
-12132.6 2s1/2 0.4055 0.911

-9510.53 1d3/2 0.245 0.86

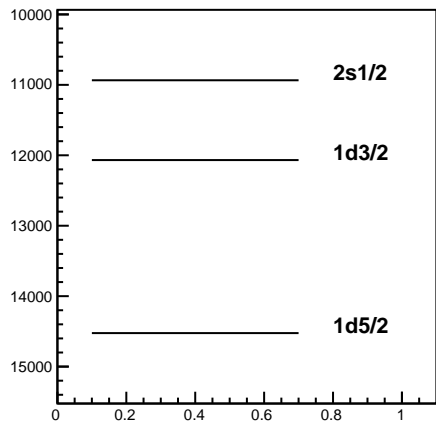
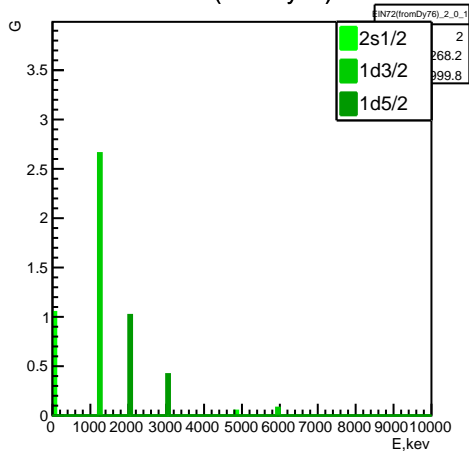
Sw67



Penalty function components

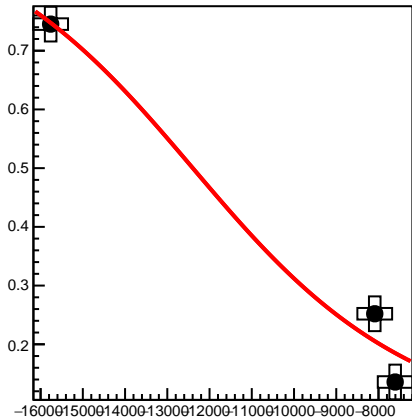
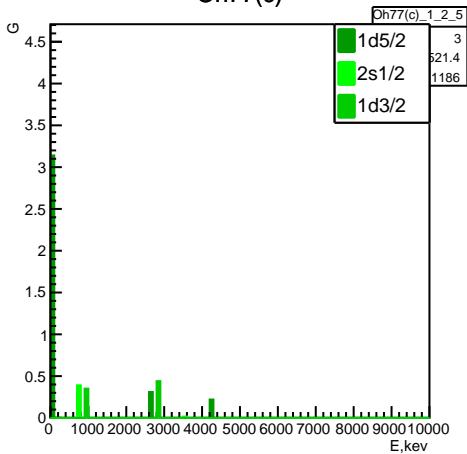


EIN72(fromDy76)

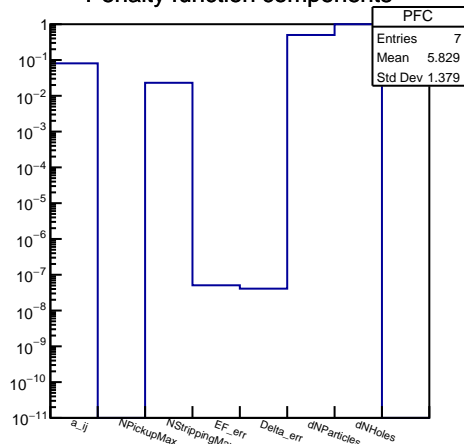


Experiment: Sw67 (5) EIN72(fromDy76) (6)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.87  
 $E_F: -12813.2 \pm 265.431$  keV  
 $\Delta: 4373.93 \pm 811.159$  keV  
 penalty: 0.28727  
 $SPE, keV \text{ nlj OCC } \frac{G^+ + G^-}{2J+1}$   
 -14524.4 1d5/2 0.694167 0.868333  
 -10935 2s1/2 0.33 0.76  
 -12067.9 1d3/2 0.38375 1.1375

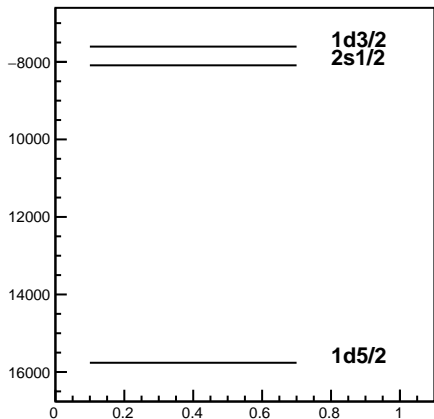
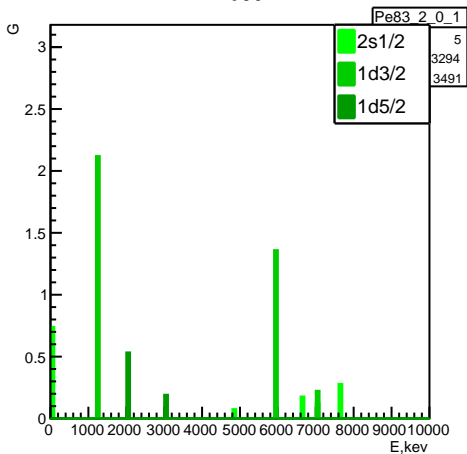
Oh77(c)



Penalty function components



Pe83



Experiment: Oh77(c) (7) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12395.6 \pm 856.748$  keV $\Delta: 5907.03 \pm 1242.82$  keV

penalty: 0.308402

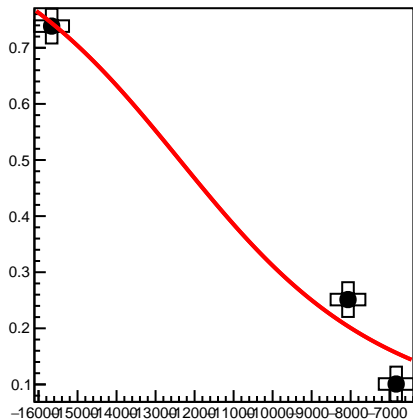
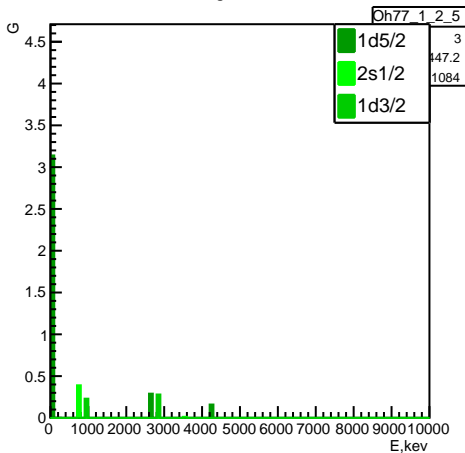
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15761.8 1d5/2 0.745333 0.732667

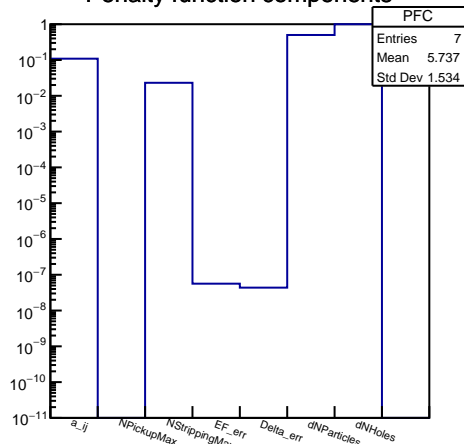
-8088.76 2s1/2 0.252 0.902

-7605.57 1d3/2 0.13575 1.1235

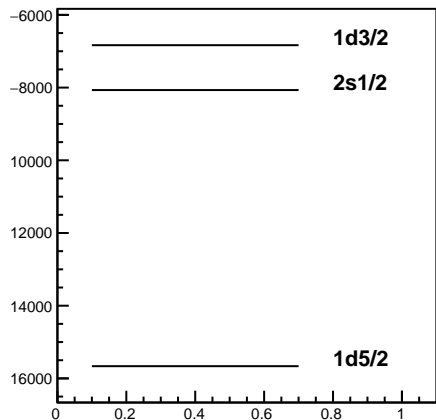
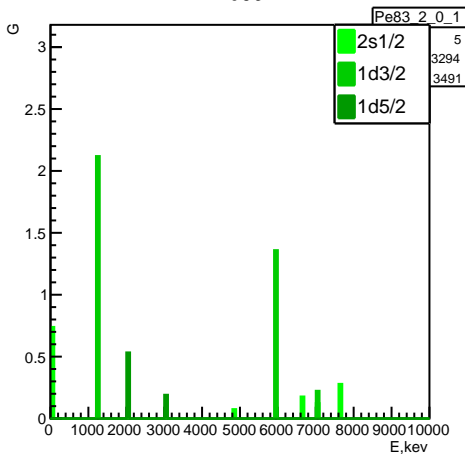
Oh77



Penalty function components



Pe83



Experiment: Oh77 (7) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12382.5  $\pm$  950.77 keV

$\Delta$ : -5864.39  $\pm$  1326.73 keV

penalty: 0.31384

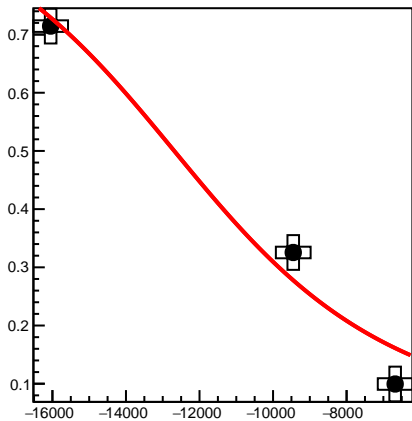
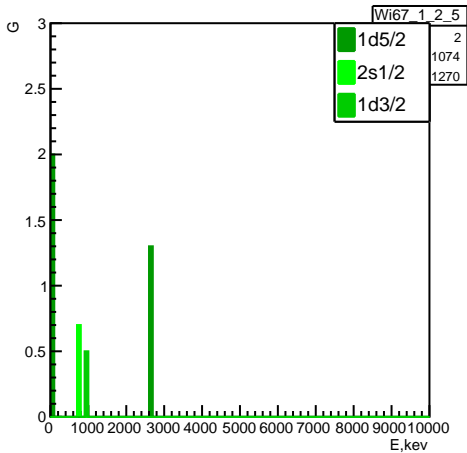
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15663.7 1d5/2 0.738667 0.719333

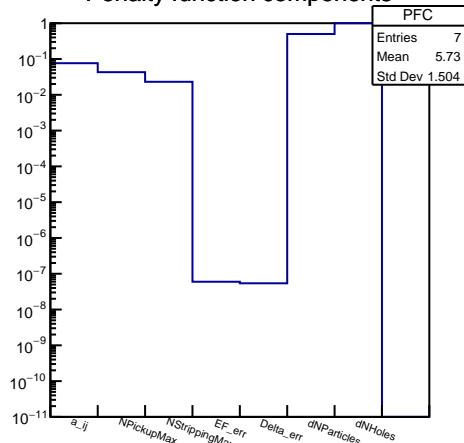
-8067.72 2s1/2 0.25125 0.9005

-6833.39 1d3/2 0.10075 1.0535

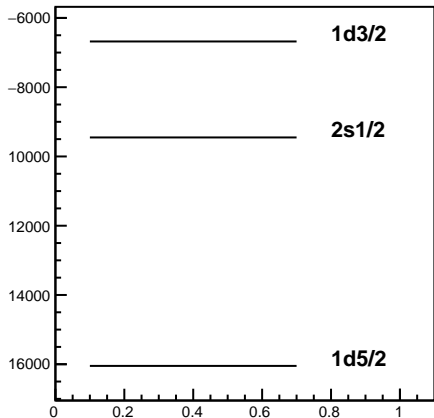
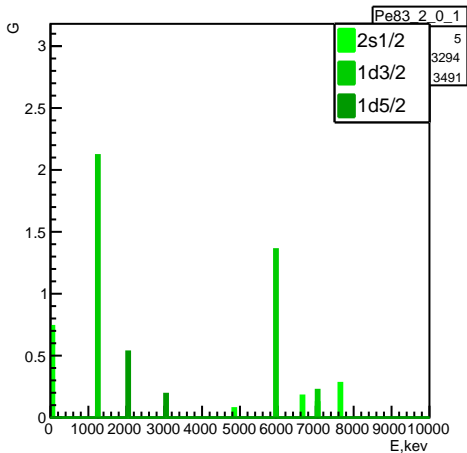
Wi67



Penalty function components



Pe83



Experiment: Wi67 (4) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12687 ± 1009.23 keV

Δ: 6520.24 ± 1644.96 keV

penalty: 0.315821

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

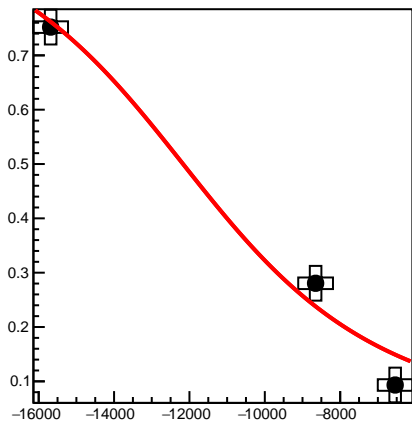
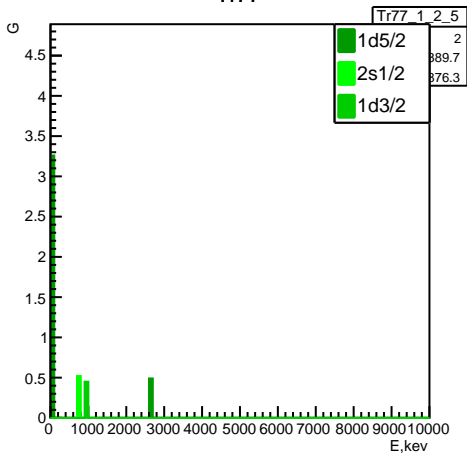
-16048.3 1d5/2 0.7145 0.671

-9450.94 2s1/2 0.3255 1.049

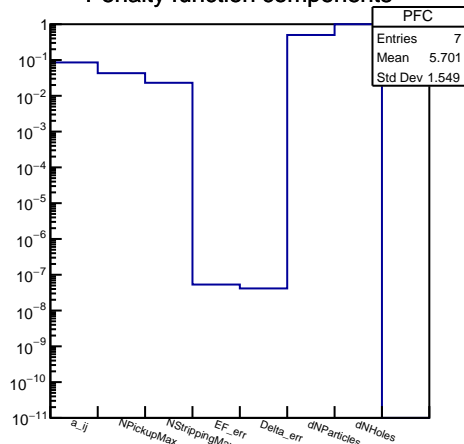
-6679.37 1d3/2 0.0995 1.051



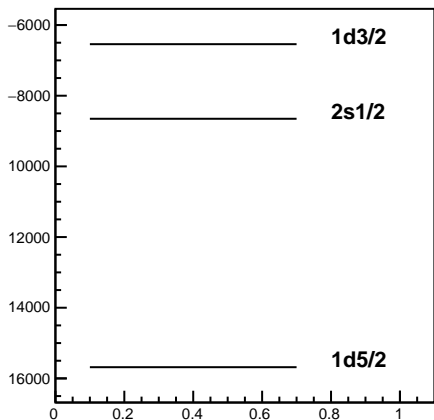
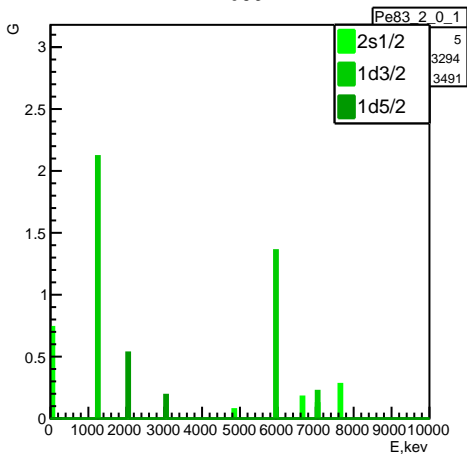
Tr77



Penalty function components



Pe83



Experiment: Tr77 (4) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12169.9 ± 898.858 keV

Δ: -5715.07 ± 1260.22 keV

penalty: 0.317584

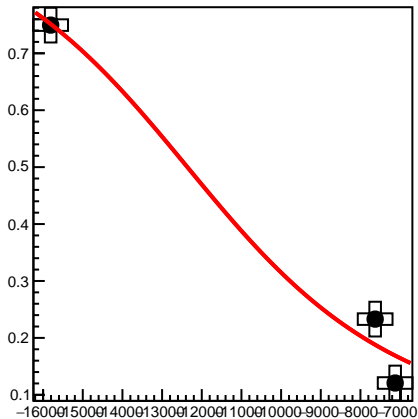
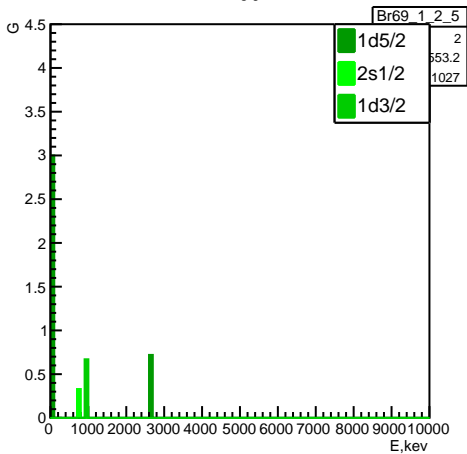
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-15682.8 1d5/2 0.752 0.746

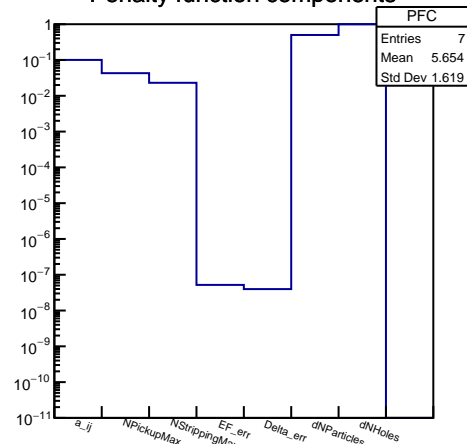
-8652.43 2s1/2 0.2805 0.959

-6541.47 1d3/2 0.09325 1.0385

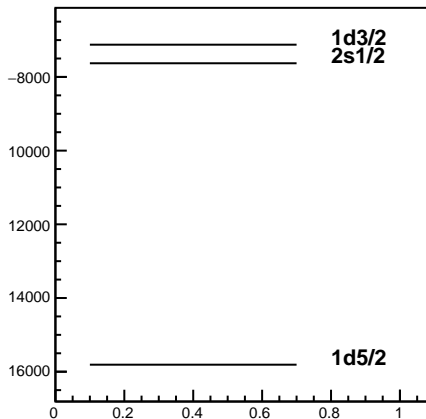
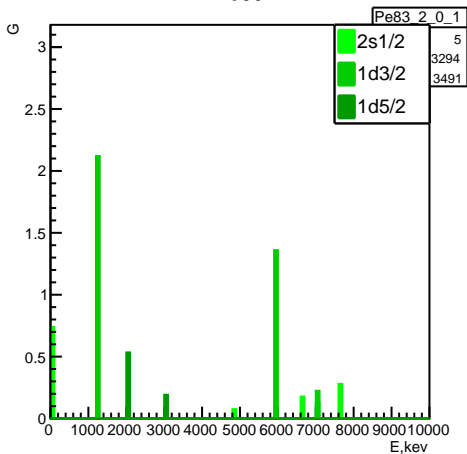
Br69



Penalty function components



Pe83



Experiment: Br69 (4) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-12361.9 \pm 878.075$  keV $\Delta$ :  $-5925.62 \pm 1208.69$  keV

penalty: 0.320468

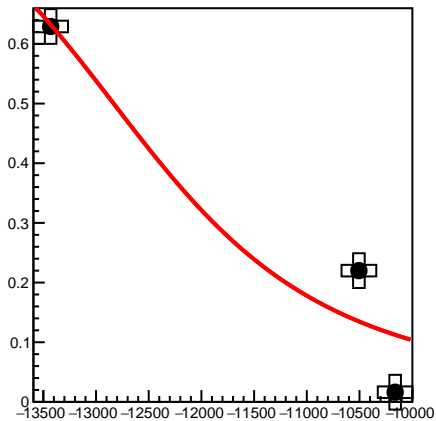
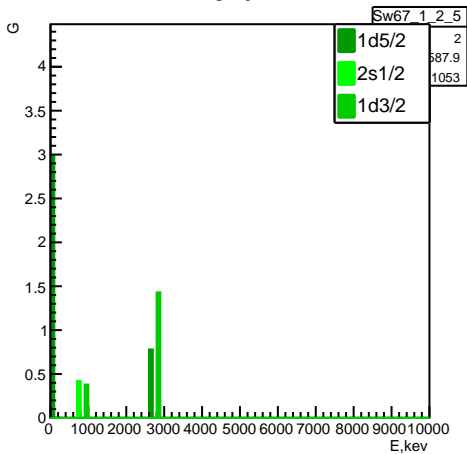
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-15809.7 1d5/2 0.7495 0.741

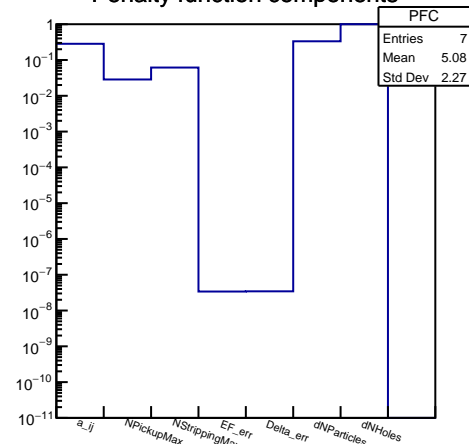
-7629.08 2s1/2 0.233 0.864

-7124.64 1d3/2 0.12075 1.0935

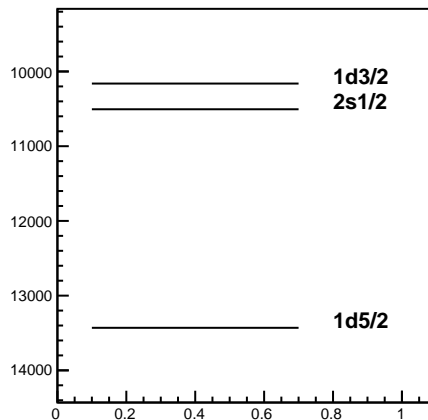
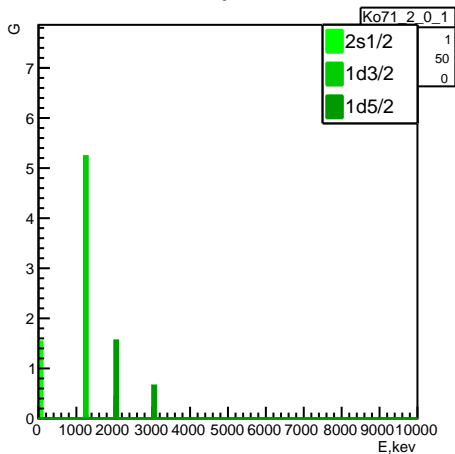
Sw67



Penalty function components



Ko71



Experiment: Sw67 (5) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12832.8 \pm 573.576$  keV $\Delta: -2177.37 \pm 1046.65$  keV

penalty: 0.32828

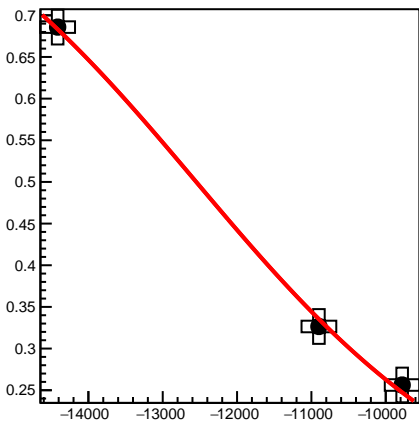
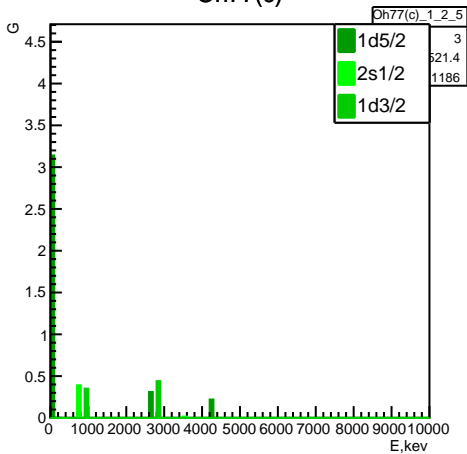
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13430.6 1d5/2 0.629167 0.998333

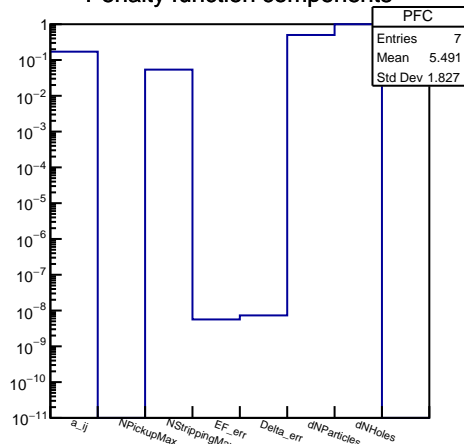
-10505.7 2s1/2 0.22 0.98

-10161.6 1d3/2 0.01625 1.8725

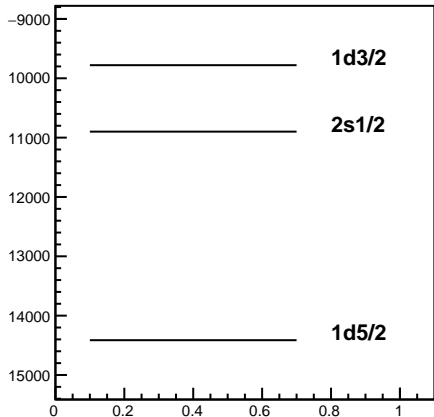
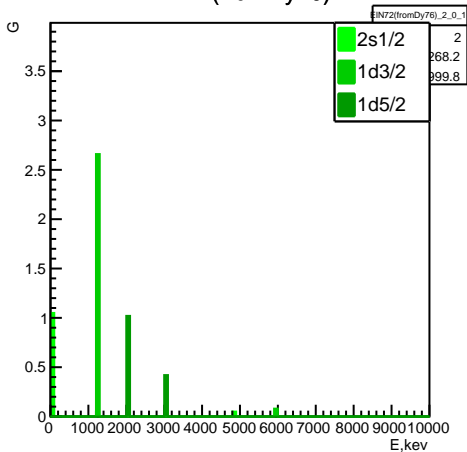
Oh77(c)



Penalty function components



EIN72(fromDy76)



Experiment: Oh77(c) (7) EIN72(fromDy76) (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12549.4  $\pm$  95.1956 keV

$\Delta$ : 4731.67  $\pm$  222.222 keV

penalty: 0.331691

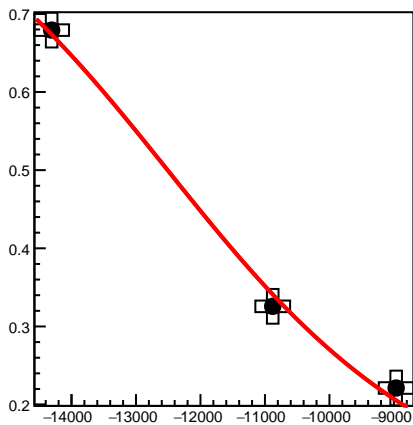
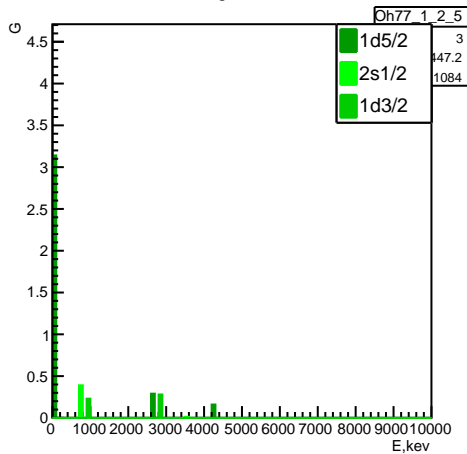
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-14413.6 1d5/2 0.685833 0.851667

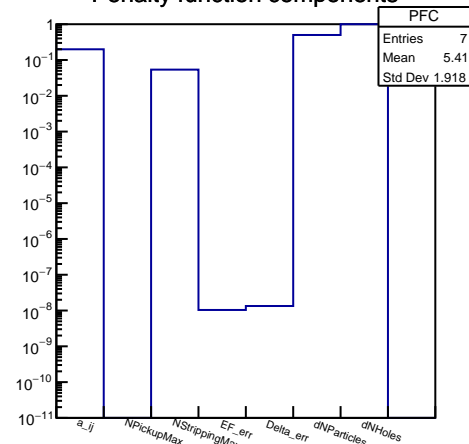
-10899 2s1/2 0.3265 0.753

-9779.11 1d3/2 0.25625 0.8825

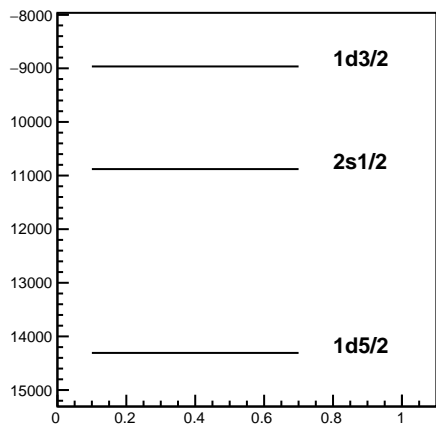
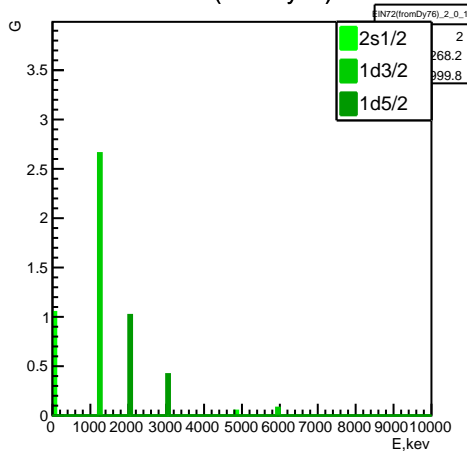
Oh77



Penalty function components



EIN72(fromDy76)



**Experiment: Oh77 (7) EIN72(fromDy76) (6)**

**neutron transfer**

**n separation energy A:17178.6, A+1: 8472.87**

**E\_F: -12509.4  $\pm$  175.223 keV**

**$\Delta$ : 4860.64  $\pm$  406.963 keV**

**penalty: 0.337129**

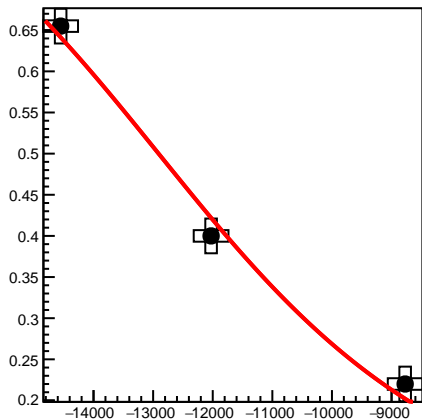
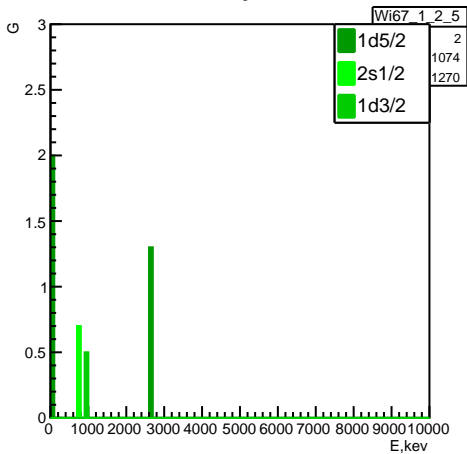
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**

**-14307.9 1d5/2 0.679167 0.838333**

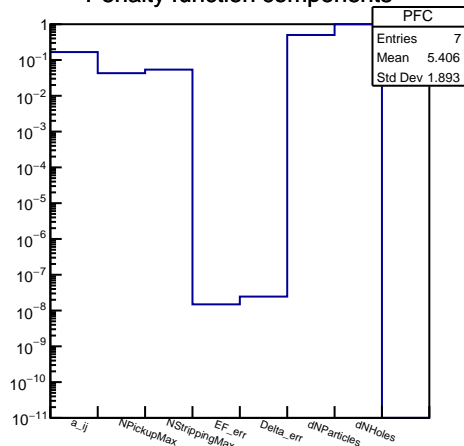
**-10879.4 2s1/2 0.32575 0.7515**

**-8965.16 1d3/2 0.22125 0.8125**

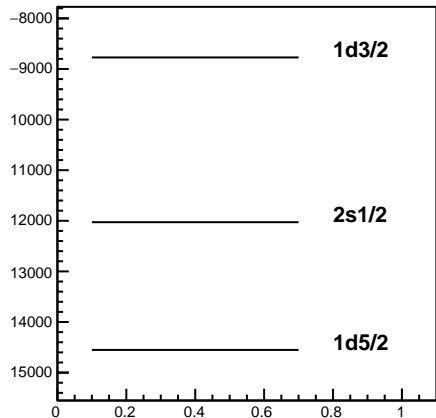
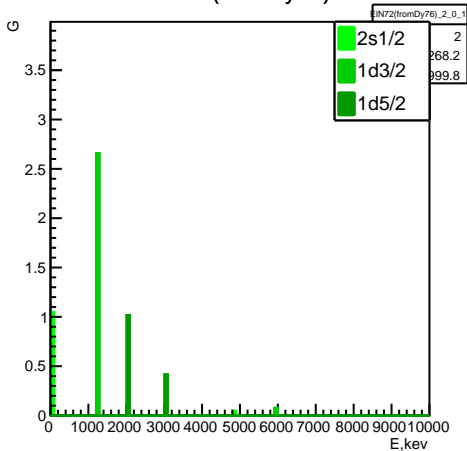
Wi67



Penalty function components

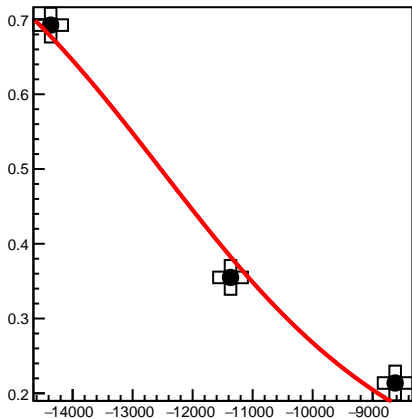
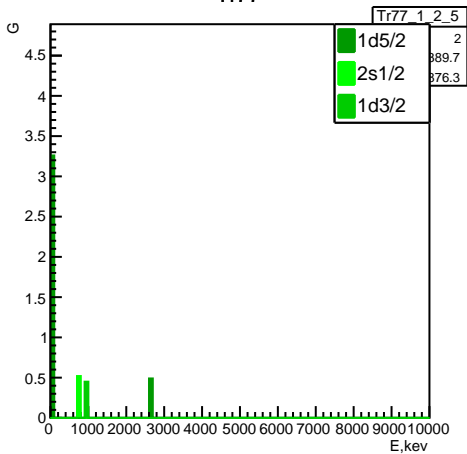


EIN72(fromDy76)

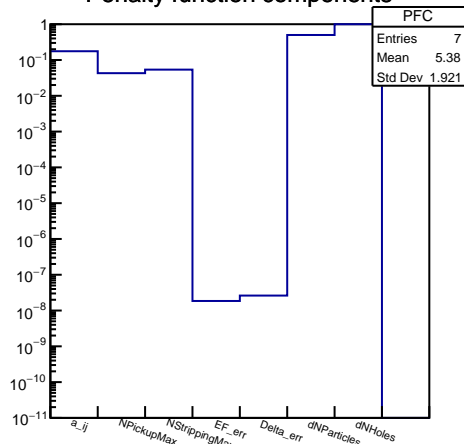


**Experiment: Wi67 (4) EIN72(fromDy76) (6)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
**E\_F: -12908.2  $\pm$  251.353 keV**  
 **$\Delta$ : 5575.13  $\pm$  745.508 keV**  
**penalty: 0.33911**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-14551.7 1d5/2 0.655 0.79**  
**-12027.7 2s1/2 0.4 0.9**  
**-8771.88 1d3/2 0.22 0.81**

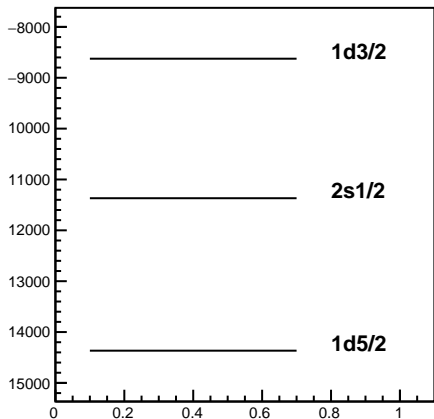
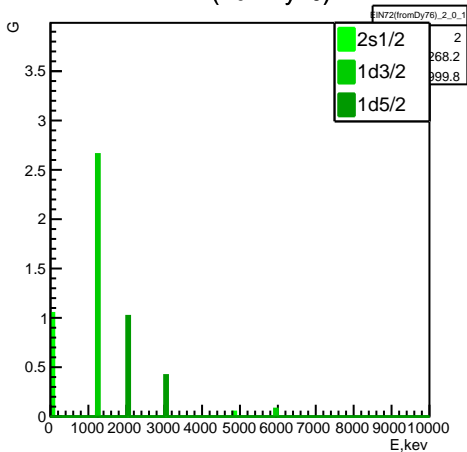
Tr77



Penalty function components

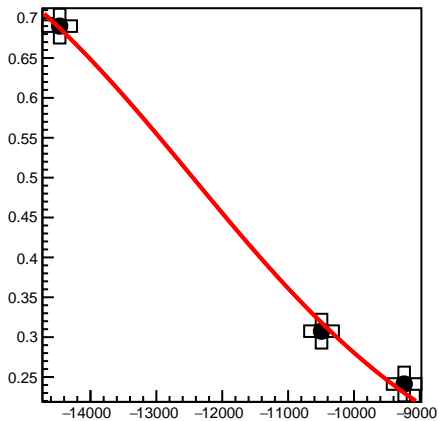
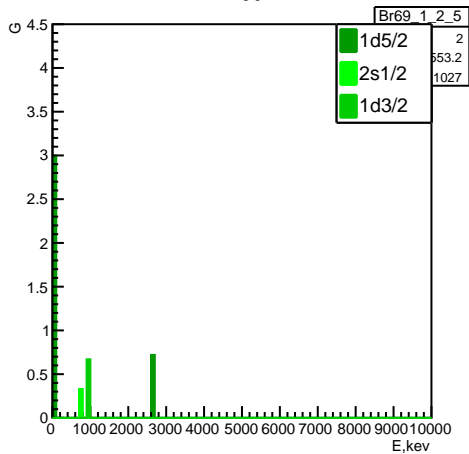


EIN72(fromDy76)

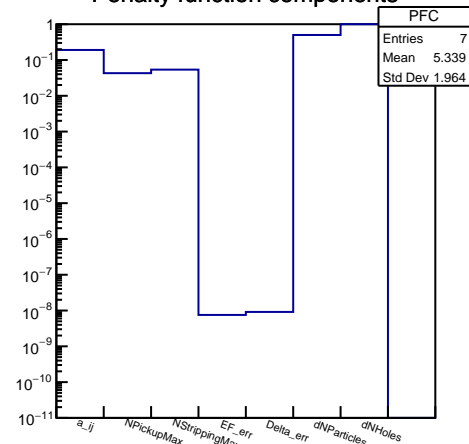


**Experiment: Tr77 (4) EIN72(fromDy76) (6)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.8**  
**E\_F: -12533 ± 312.403 keV**  
**Δ: 4826.86 ± 796.159 keV**  
**penalty: 0.340872**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-14366.2 1d5/2 0.6925 0.865**  
**-11368.6 2s1/2 0.355 0.81**  
**-8625.11 1d3/2 0.21375 0.7975**

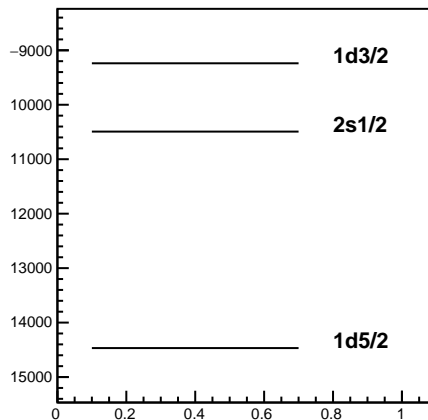
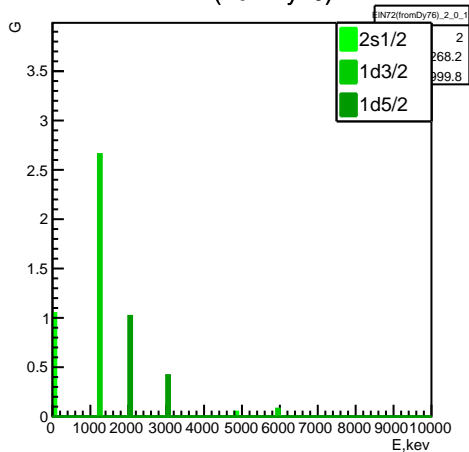
Br69



Penalty function components



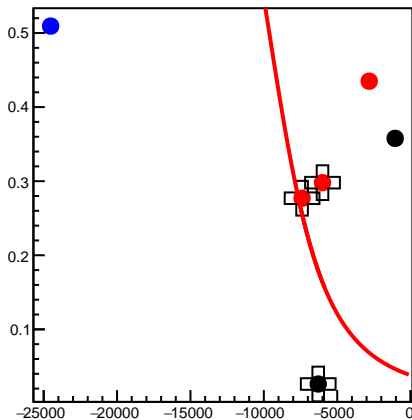
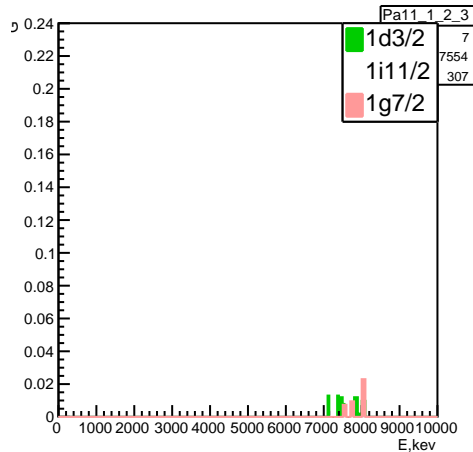
EIN72(fromDy76)



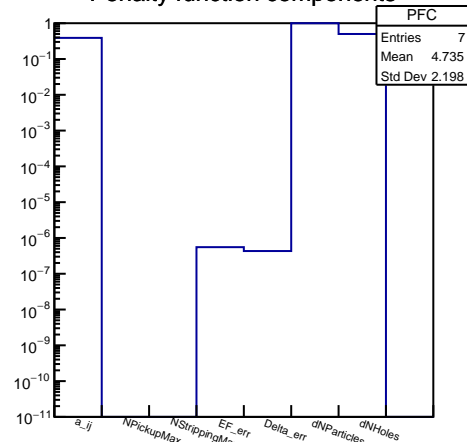
**Experiment: Br69 (4) EIN72(fromDy76) (6)**  
**neutron transfer**  
**n separation energy A:17178.6, A+1: 8472.87**  
**E\_F: -12445.1 ± 127.255 keV**  
**Δ: 5003.46 ± 277.978 keV**  
**penalty: 0.343757**  
**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**   
**-14467.9 1d5/2 0.69 0.86**  
**-10492.9 2s1/2 0.3075 0.715**  
**-9238.72 1d3/2 0.24125 0.8525**



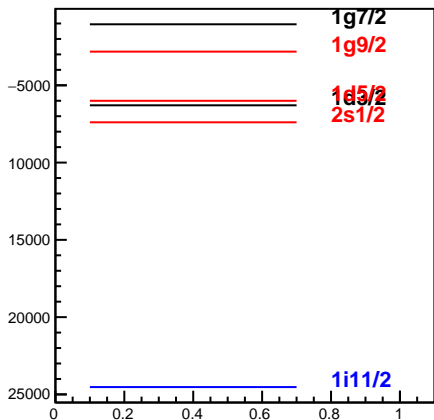
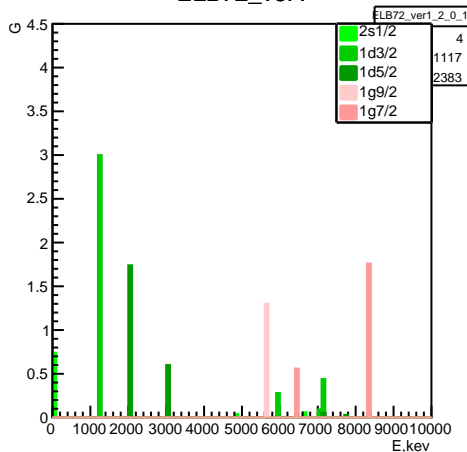
Pa11



Penalty function components



ELB72\_ver1



Experiment: Pa11 (13) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -9626.33 \pm 9344.03$  keV $\Delta: 3980.47 \pm 13107.8$  keV

penalty: 0.363306

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6294.48 1d3/2 0.0262125 0.982425

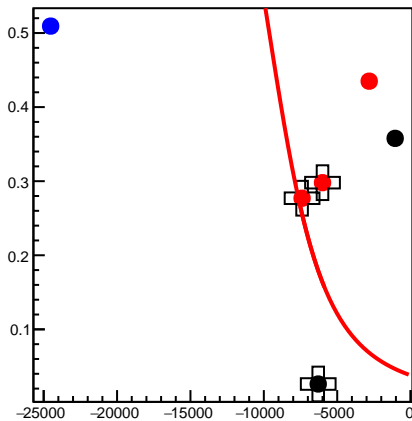
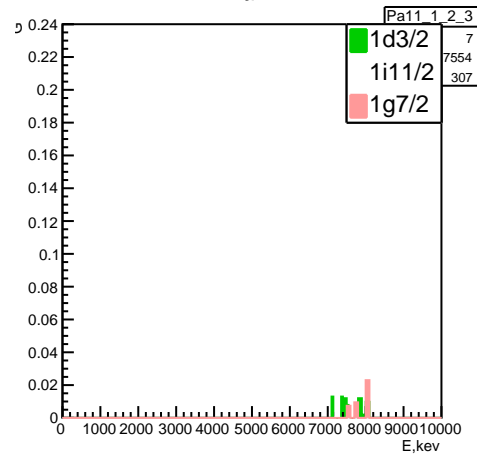
-24525.5 1i11/2 0.509333 0.446

-1052.27 1g7/2 0.3578 0.404

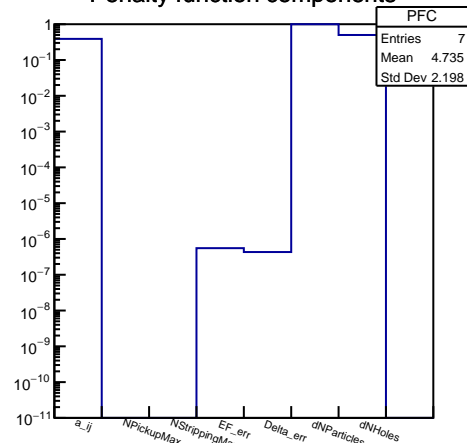
-7393.98 2s1/2 0.277 3.21143e-322

-6002.31 1d5/2 0.298 0.389192

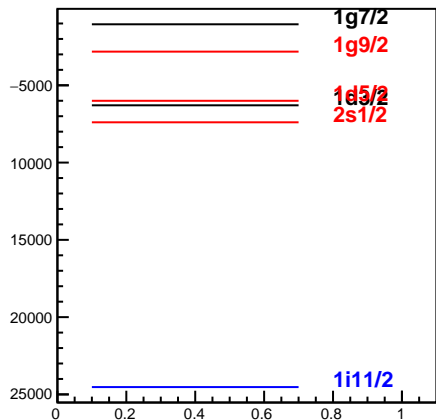
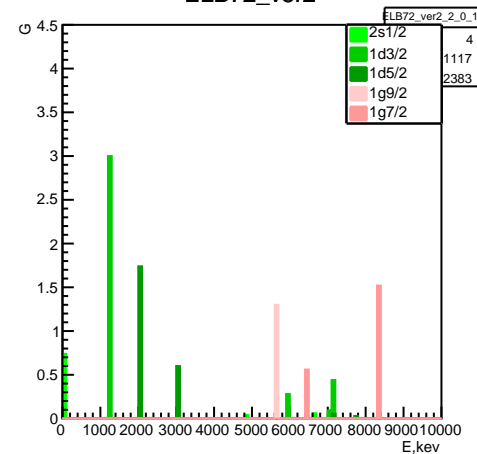
Pa11



Penalty function components



ELB72\_ver2



Experiment: Pa11 (13) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -9626.33 \pm 9344.03$  keV $\Delta: 3980.47 \pm 13107.8$  keV

penalty: 0.363306

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6294.48 1d3/2 0.0262125 0.982425

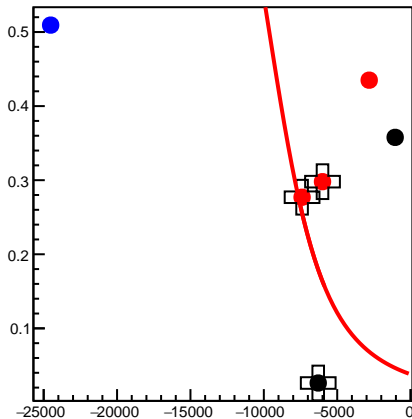
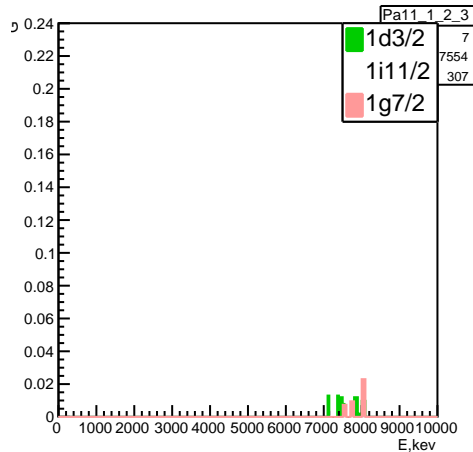
-24525.5 1i11/2 0.509333 0.446

-1052.27 1g7/2 0.3578 0.404

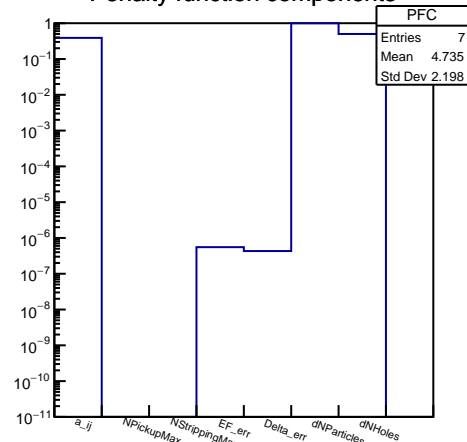
-7393.98 2s1/2 0.277 3.21143e-322

-6002.31 1d5/2 0.298 0.389192

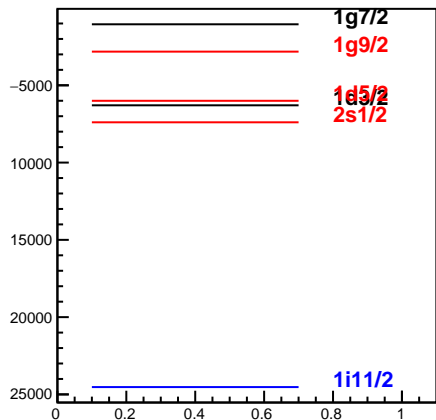
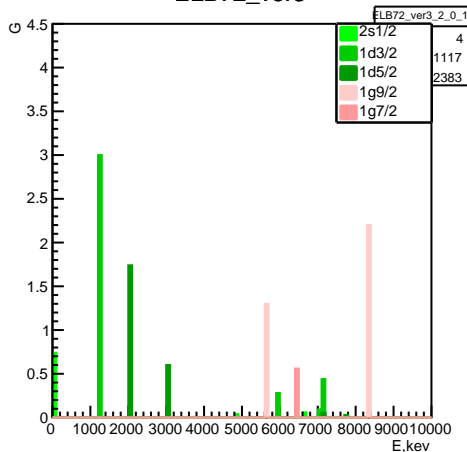
Pa11



Penalty function components



ELB72\_ver3



Experiment: Pa11 (13) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -9626.33 \pm 9344.03$  keV $\Delta: 3980.47 \pm 13107.8$  keV

penalty: 0.363306

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6294.48 1d3/2 0.0262125 0.982425

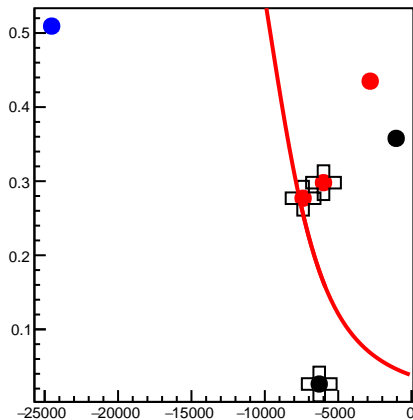
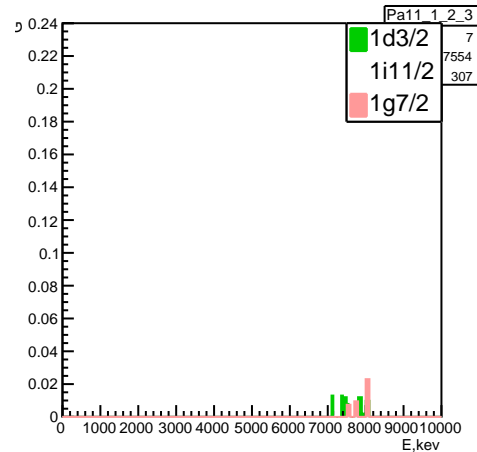
-24525.5 1i11/2 0.509333 0.446

-1052.27 1g7/2 0.3578 0.404

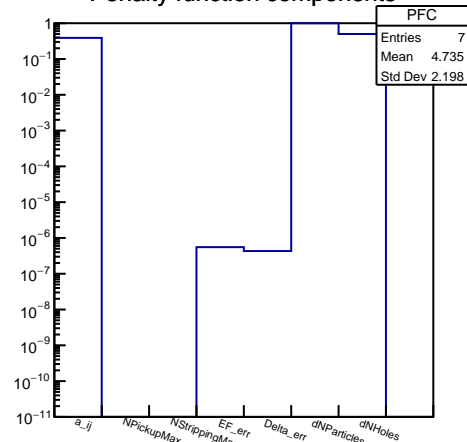
-7393.98 2s1/2 0.277 3.21143e-322

-6002.31 1d5/2 0.298 0.389192

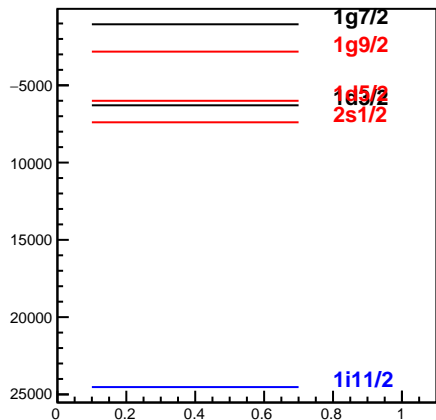
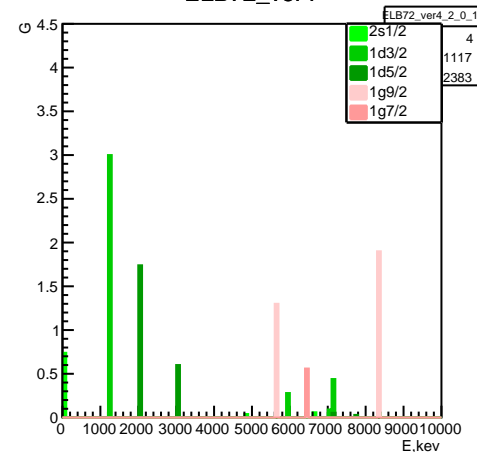
Pa11



Penalty function components



ELB72\_ver4



Experiment: Pa11 (13) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -9626.33 \pm 9344.03$  keV $\Delta: 3980.47 \pm 13107.8$  keV

penalty: 0.363306

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6294.48 1d3/2 0.0262125 0.982425

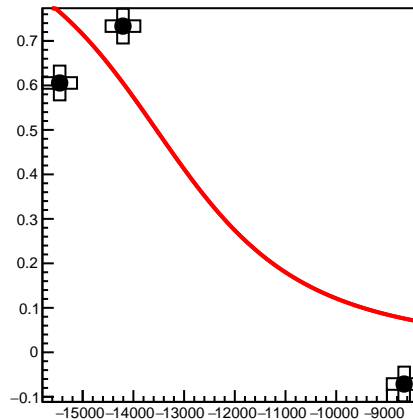
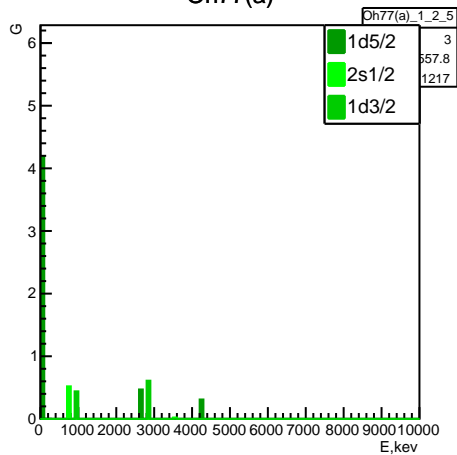
-24525.5 1i11/2 0.509333 0.446

-1052.27 1g7/2 0.3578 0.404

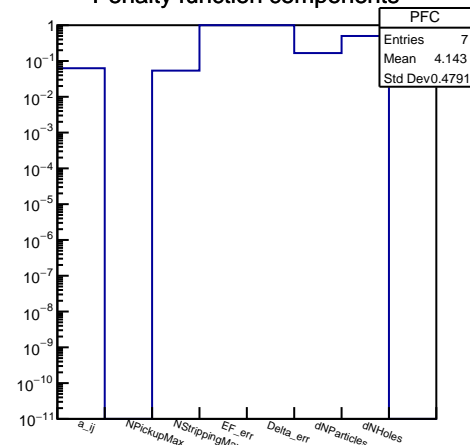
-7393.98 2s1/2 0.277 3.21143e-322

-6002.31 1d5/2 0.298 0.389192

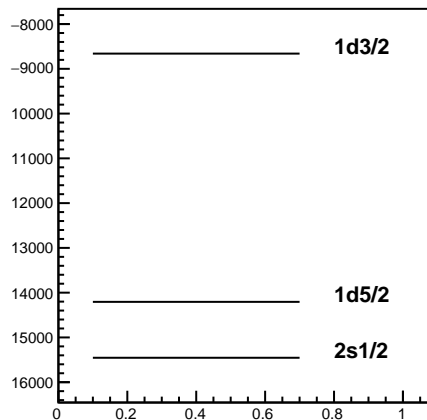
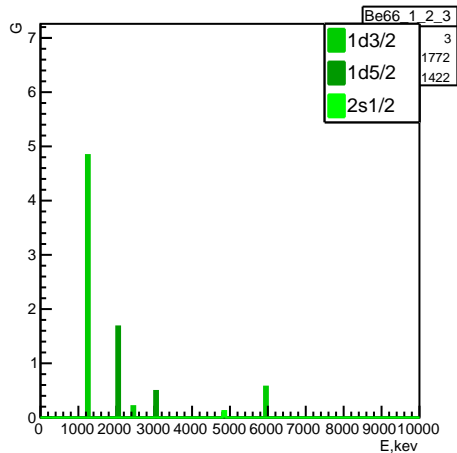
Oh77(a)



Penalty function components



Be66



Experiment: Oh77(a) (7) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -13545.6  $\pm$  1449.48 keV $\Delta$ : 3053.56  $\pm$  2920.16 keV

penalty: 9.095e+09

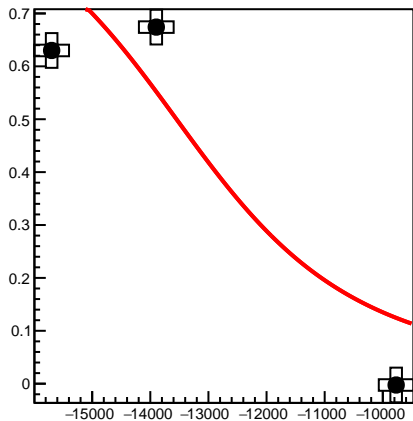
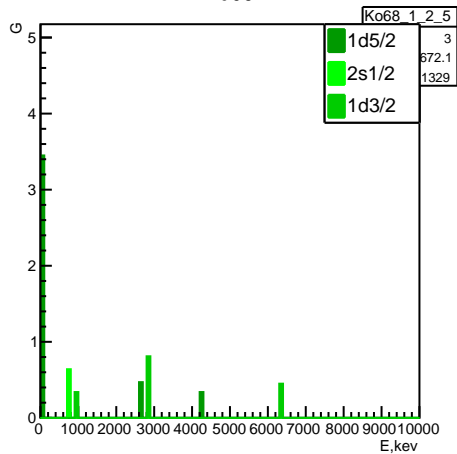
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-14205.4 1d5/2 0.733333 1.19

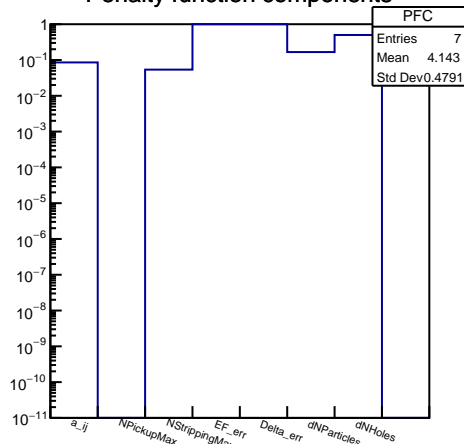
-15454.2 2s1/2 0.6055 0.331

-8660.08 1d3/2 -0.07125 1.6675

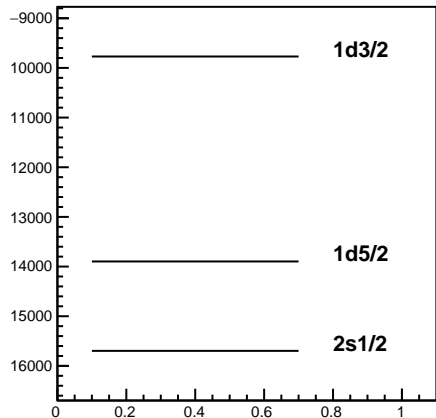
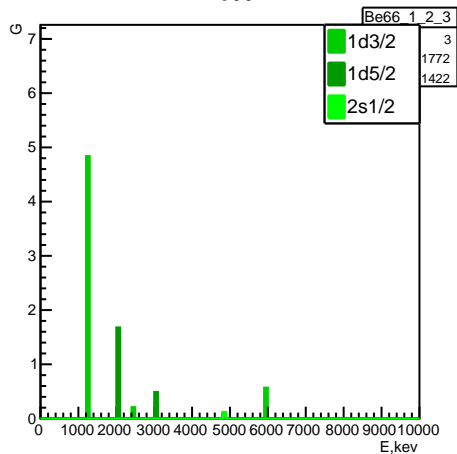
Ko68



Penalty function components



Be66



Experiment: Ko68 (7) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -13549.5 ± 1290.79 keV

Δ: 3322.23 ± 2698.35 keV

penalty: 9.095e+09

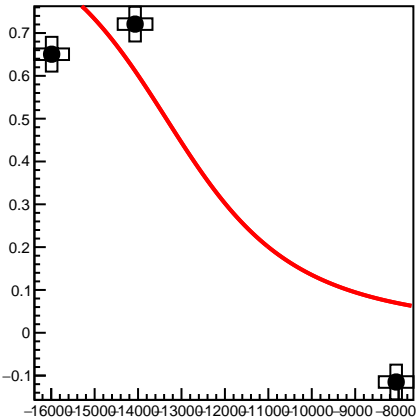
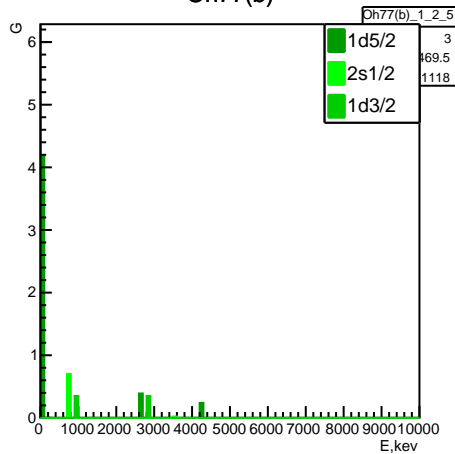
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13897.2 1d5/2 0.674167 1.07167

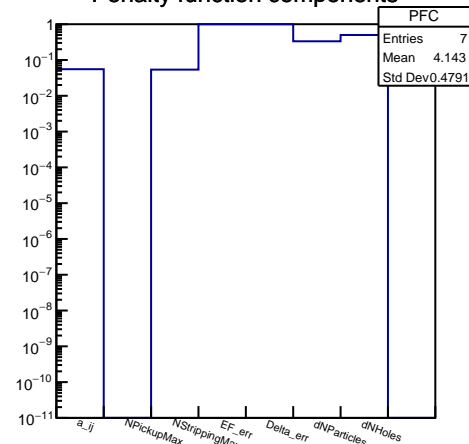
-15697.4 2s1/2 0.63 0.38

-9770.29 1d3/2 -0.0025 1.805

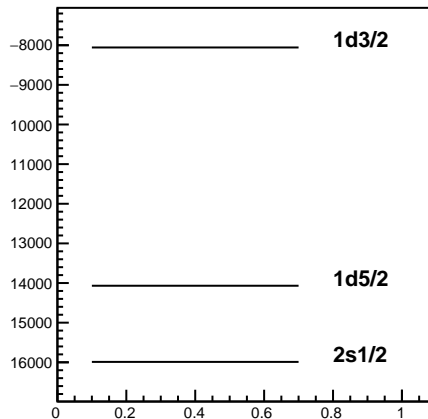
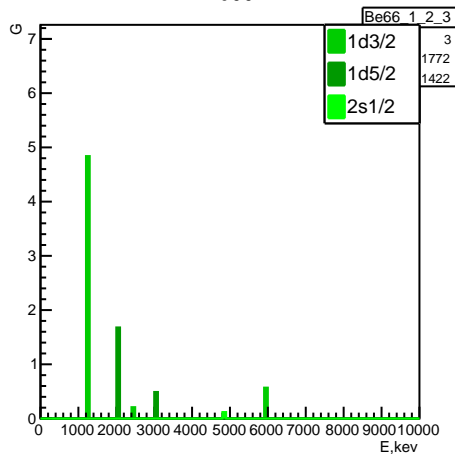
Oh77(b)



Penalty function components



Be66



Experiment: Oh77(b) (7) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -13350.6 \pm 1699.43$  keV $\Delta: -3138.88 \pm 3362.56$  keV

penalty: 9.095e+09

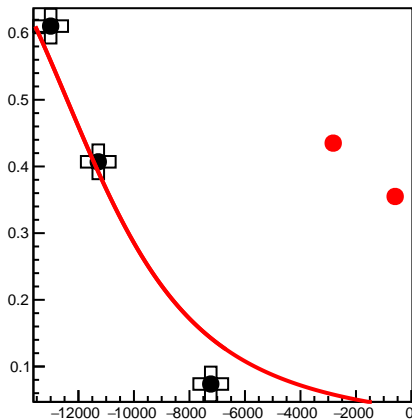
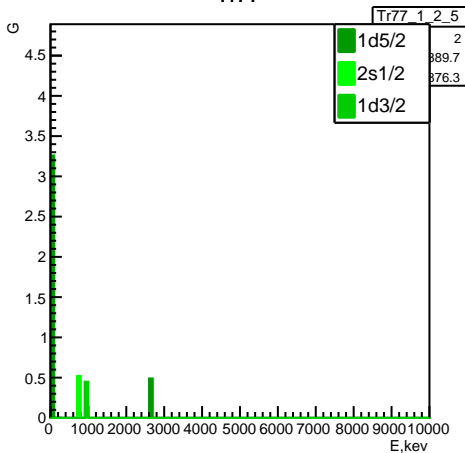
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-14068.4 1d5/2 0.720833 1.165

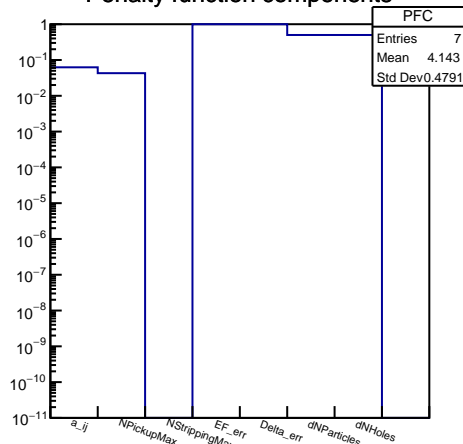
-15989.8 2s1/2 0.6505 0.421

-8056.77 1d3/2 -0.115 1.58

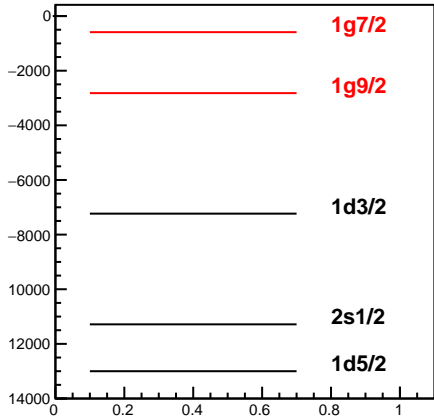
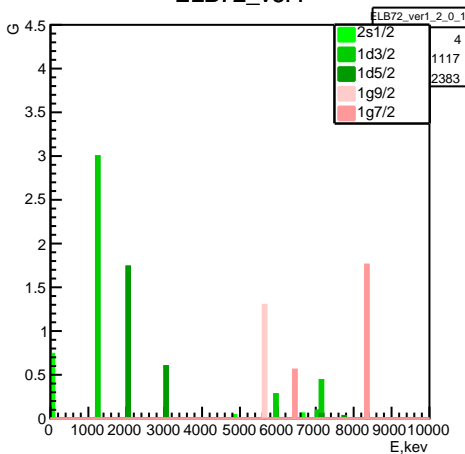
Tr77



Penalty function components



ELB72\_ver1



Experiment: Tr77 (4) ELB72\_ver1 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12408.1  $\pm$  653734 keV $\Delta$ : 5068.95  $\pm$  10.8606 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13000.8 1d5/2 0.6105 1.029

-11285 2s1/2 0.407 0.706

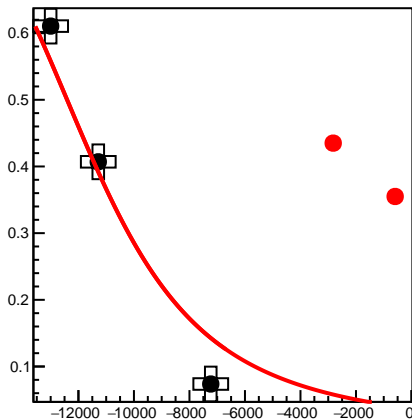
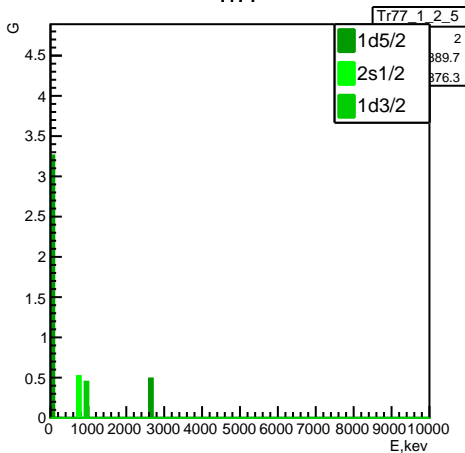
-7232.4 1d3/2 0.07375 1.0775

-2820.87 1g9/2 0.435 5.22215e-315

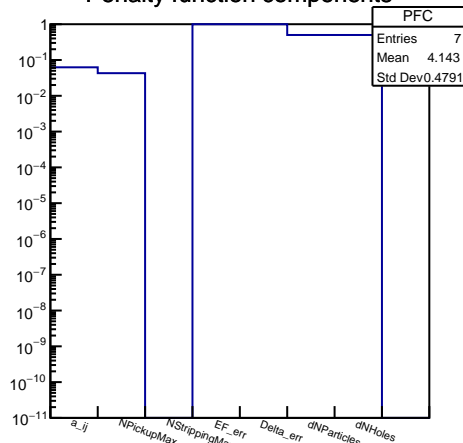
-588.767 1g7/2 0.355 2.37152e-322



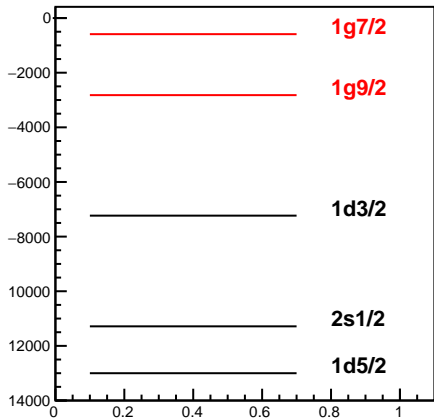
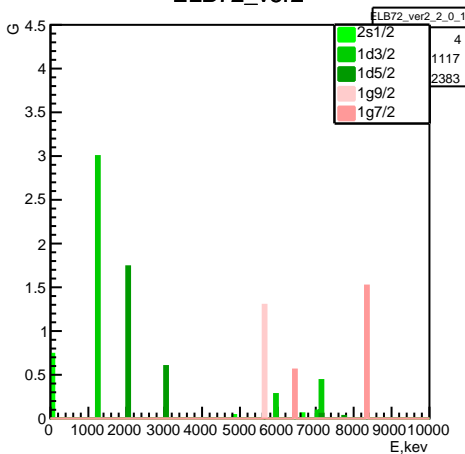
Tr77



Penalty function components



ELB72\_ver2



Experiment: Tr77 (4) ELB72\_ver2 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -12408.1  $\pm$  653734 keV $\Delta$ : 5068.95  $\pm$  10.8606 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^++G^-}{2J+1}$ 

-13000.8 1d5/2 0.6105 1.029

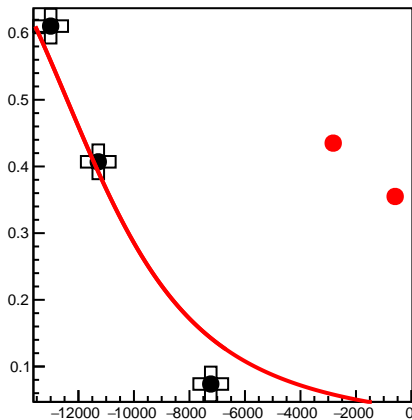
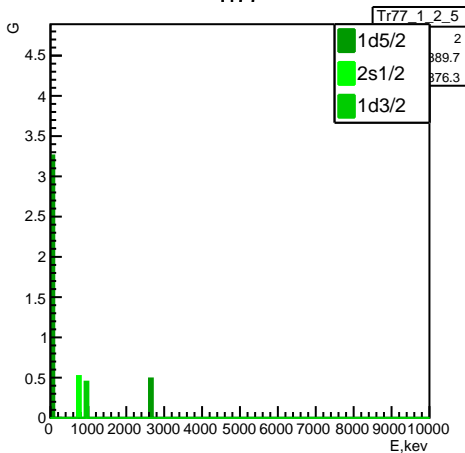
-11285 2s1/2 0.407 0.706

-7232.4 1d3/2 0.07375 1.0775

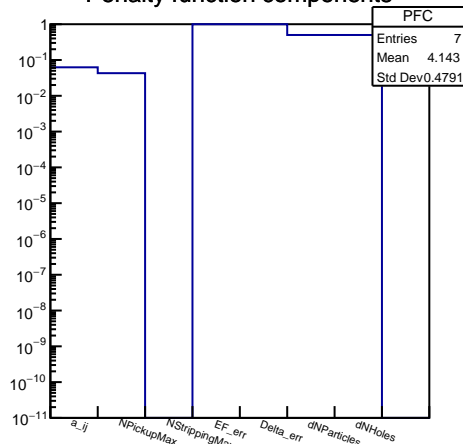
-2820.87 1g9/2 0.435 1.2732e-313

-588.767 1g7/2 0.355 2.37152e-322

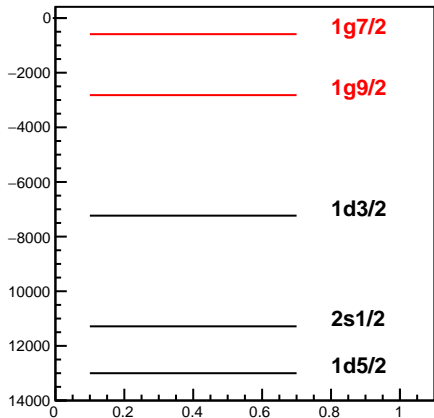
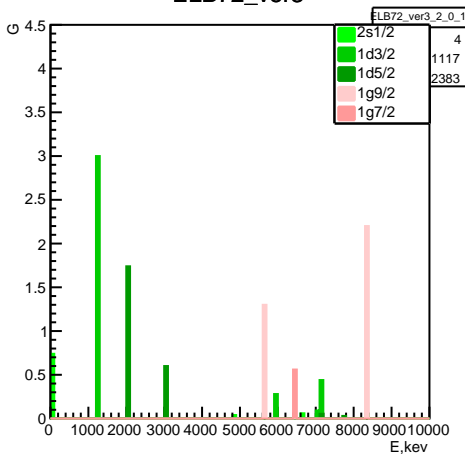
Tr77



Penalty function components



ELB72\_ver3



Experiment: Tr77 (4) ELB72\_ver3 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12408.1  $\pm$  653734 keV $\Delta$ : 5068.95  $\pm$  10.8606 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^++G^-}{2J+1}$ 

-13000.8 1d5/2 0.6105 1.029

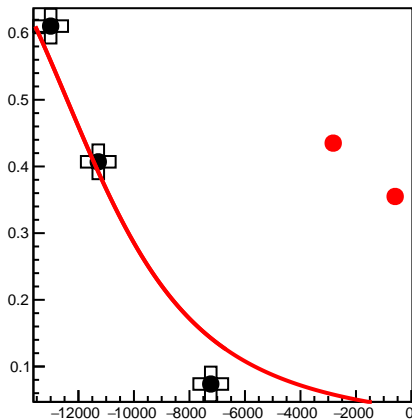
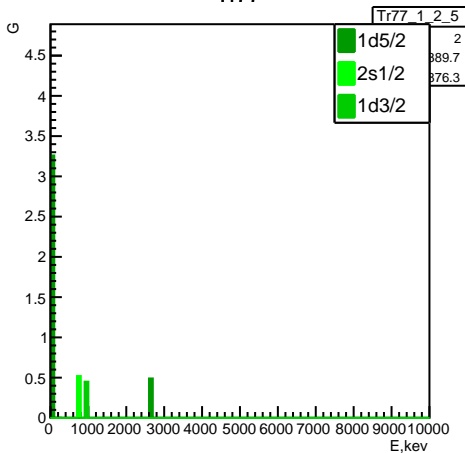
-11285 2s1/2 0.407 0.706

-7232.4 1d3/2 0.07375 1.0775

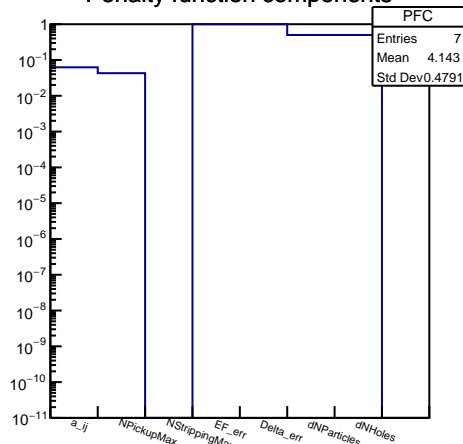
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0625

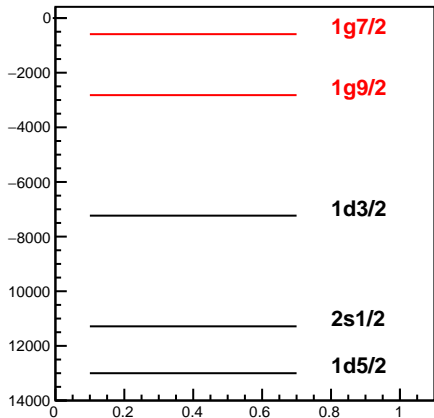
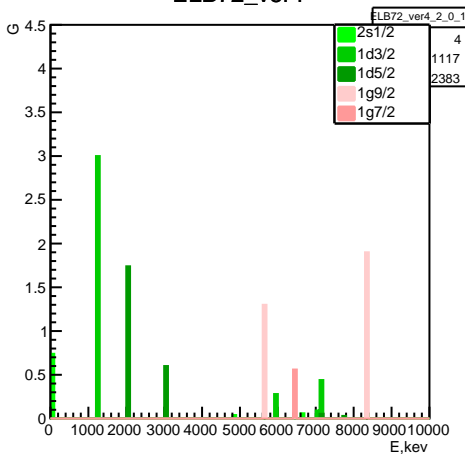
Tr77



Penalty function components



ELB72\_ver4



Experiment: Tr77 (4) ELB72\_ver4 (16)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12408.1  $\pm$  653734 keV $\Delta$ : 5068.95  $\pm$  10.8606 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^++G^-}{2J+1}$ 

-13000.8 1d5/2 0.6105 1.029

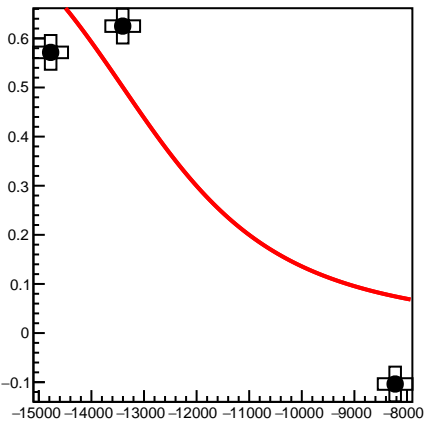
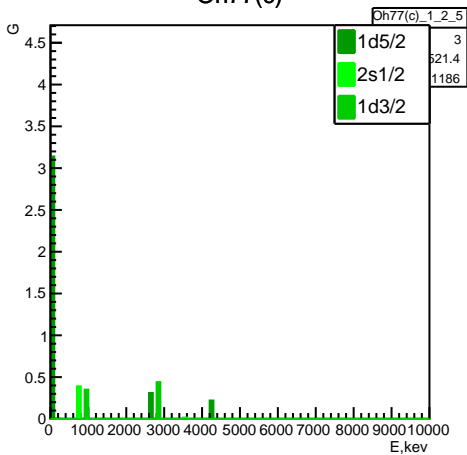
-11285 2s1/2 0.407 0.706

-7232.4 1d3/2 0.07375 1.0775

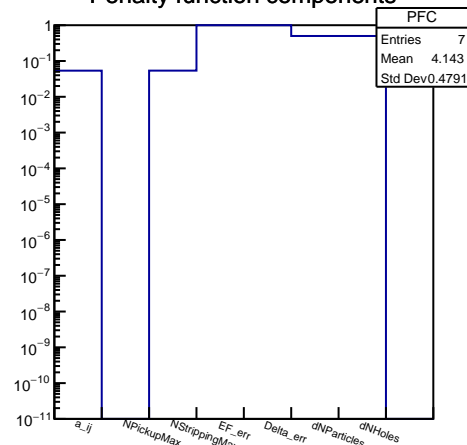
-2820.87 1g9/2 0.435 3.21143e-322

-588.767 1g7/2 0.355 0.0625

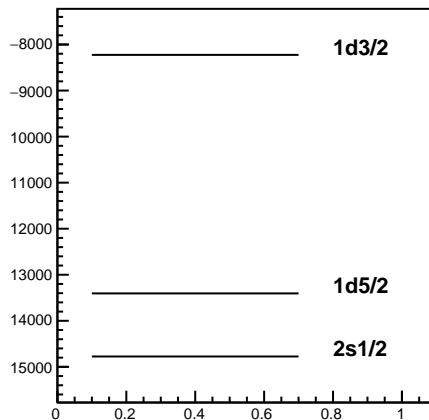
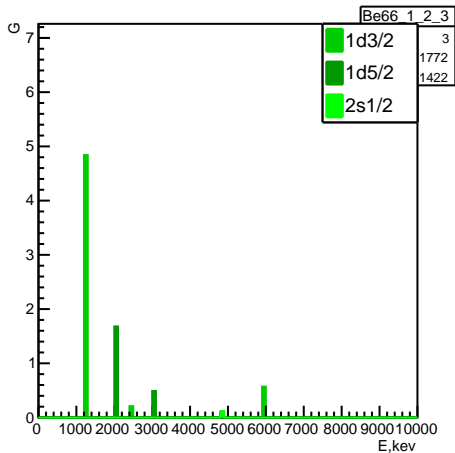
Oh77(c)



Penalty function components



Be66



Experiment: Oh77(c) (7) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -13398.4 \pm 1321.22$  keV $\Delta: -3195.34 \pm 2890.44$  keV

penalty: 9.095e+09

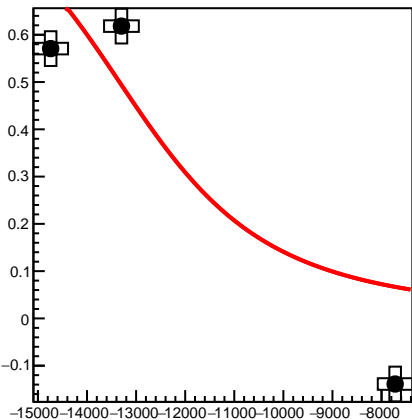
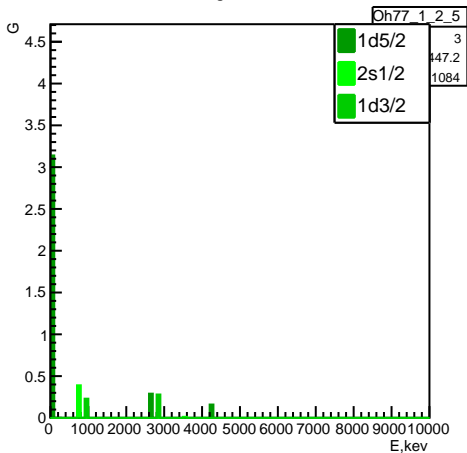
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13405 1d5/2 0.625 0.973333

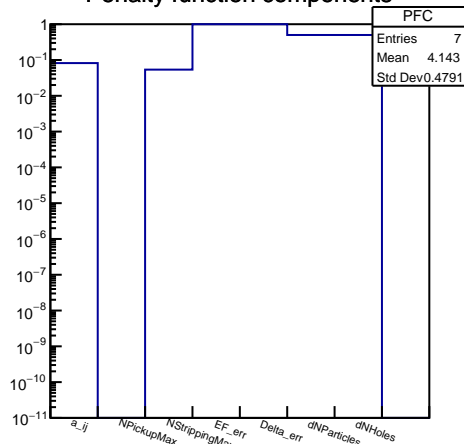
-14775 2s1/2 0.5715 0.263

-8225.09 1d3/2 -0.10375 1.6025

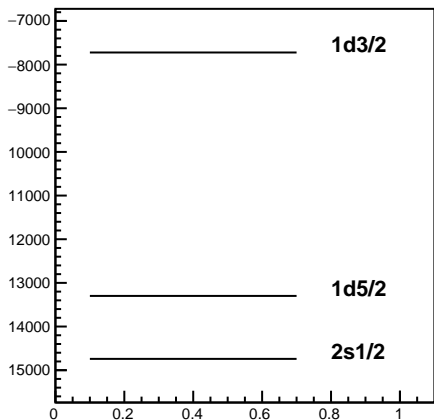
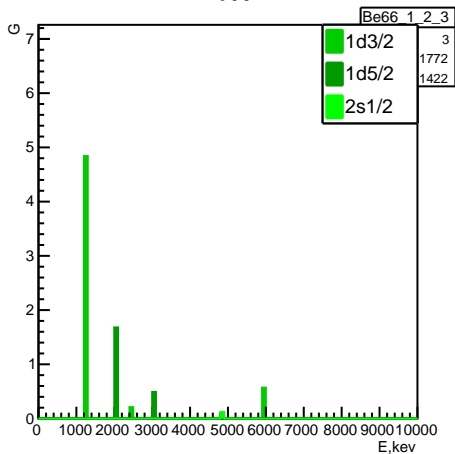
Oh77



Penalty function components



Be66



Experiment: Oh77 (7) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -13338.2  $\pm$  1462.36 keV $\Delta$ : -3235.56  $\pm$  3123.76 keV

penalty: 9.095e+09

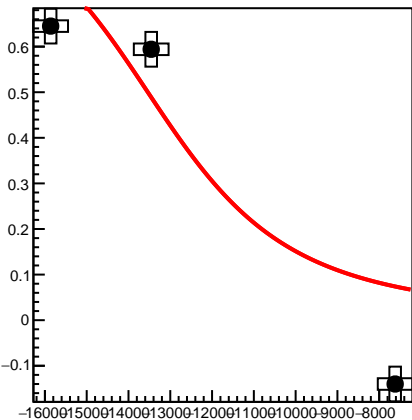
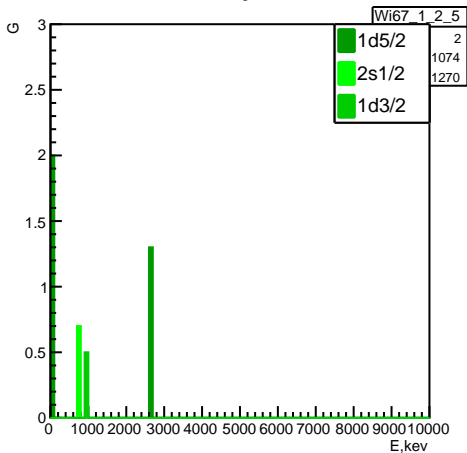
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13298.7 1d5/2 0.618333 0.96

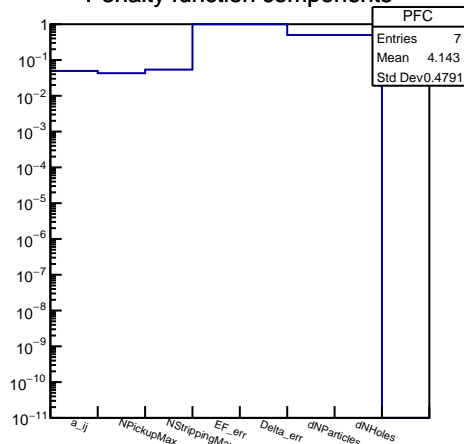
-14740.9 2s1/2 0.57075 0.2615

-7722.57 1d3/2 -0.13875 1.5325

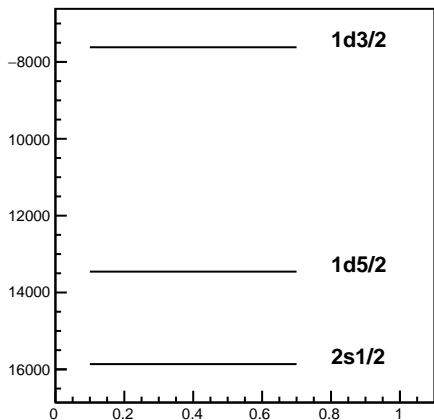
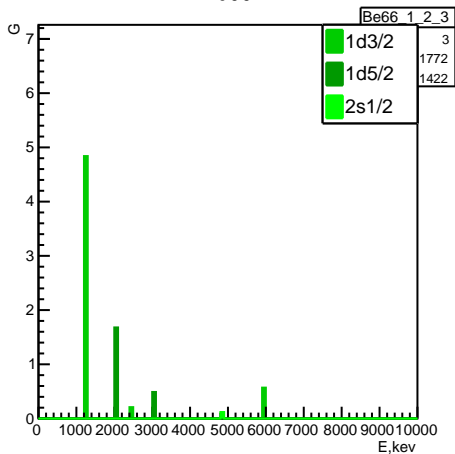
Wi67



Penalty function components



Be66



Experiment: Wi67 (4) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -13537 \pm 1771.85$  keV $\Delta: 3633.54 \pm 3406.45$  keV

penalty: 9.095e+09

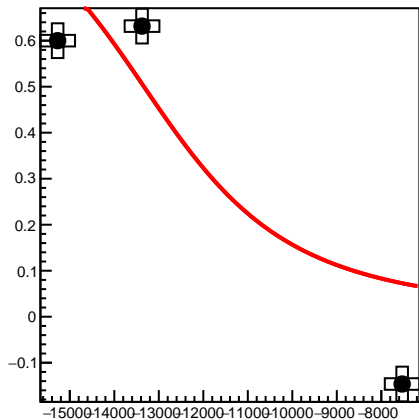
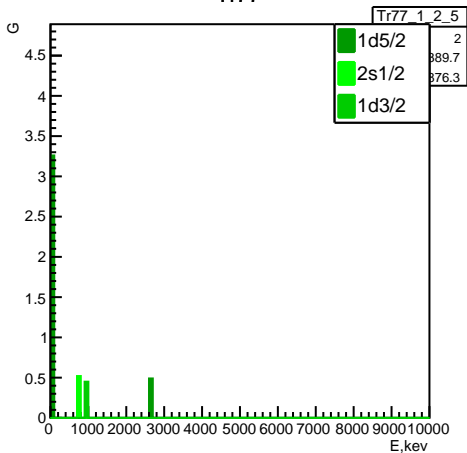
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13456.4 1d5/2 0.594167 0.911667

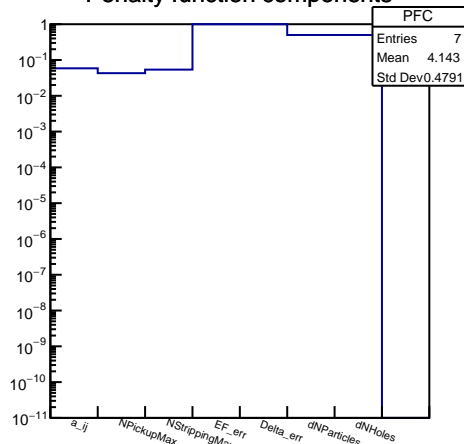
-15862.9 2s1/2 0.645 0.41

-7618.21 1d3/2 -0.14 1.53

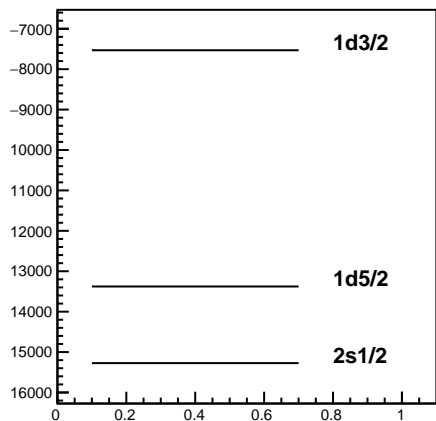
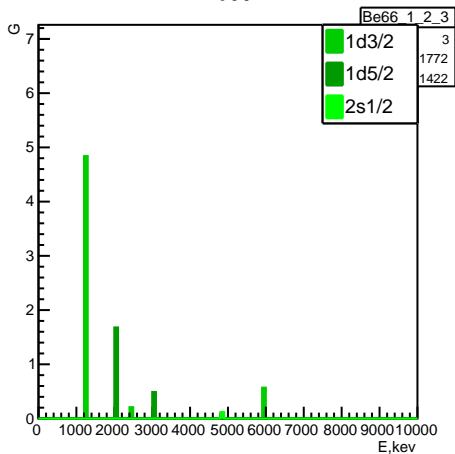
Tr77



Penalty function components



Be66



Experiment: Tr77 (4) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -13333.9  $\pm$  1776.43 keV

$\Delta$ : -3528.83  $\pm$  3509.19 keV

penalty: 9.095e+09

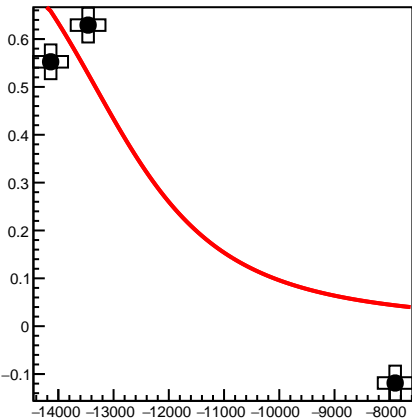
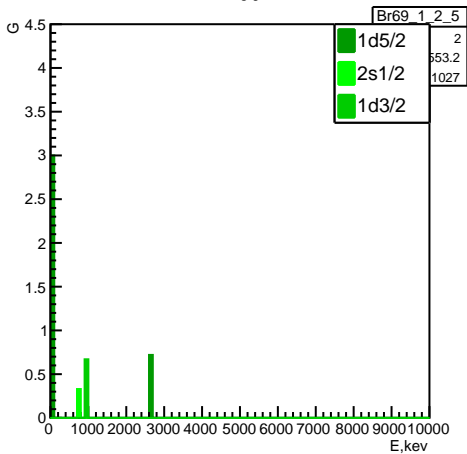
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13377.1 1d5/2 0.631667 0.986667

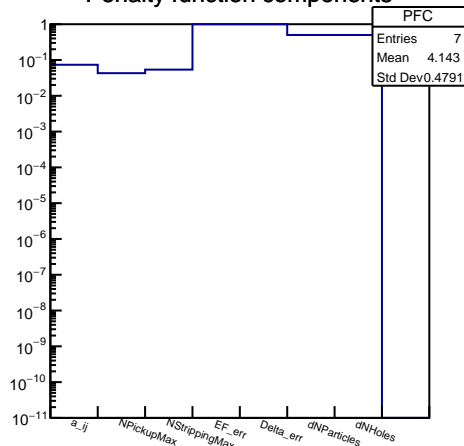
-15273.2 2s1/2 0.6 0.32

-7531.58 1d3/2 -0.14625 1.5175

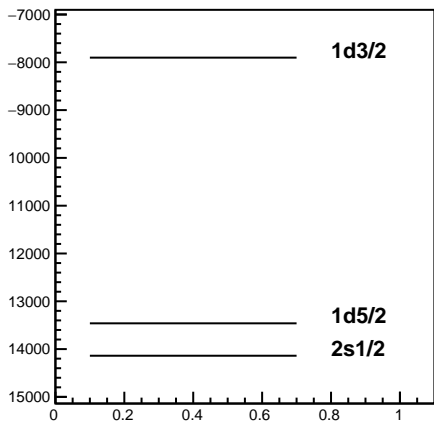
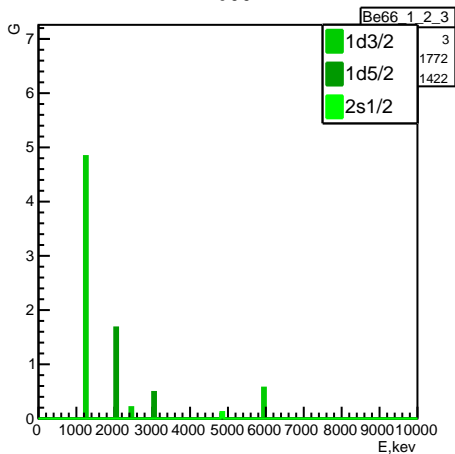
Br69



Penalty function components



Be66



**Experiment: Br69 (4) Be66 (6)**

**neutron transfer**

**n separation energy A:17178.6, A+1: 8472.87**

**E\_F: -13328.6 ± 876.901 keV**

**Δ: -2425.3 ± 2419.33 keV**

**penalty: 9.095e+09**

**SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$**

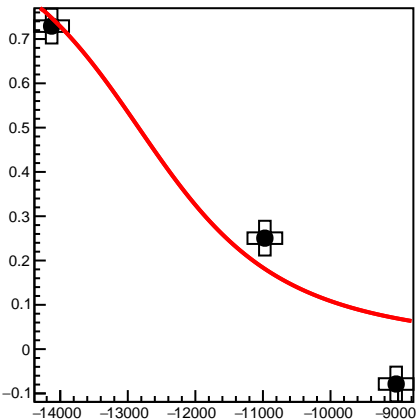
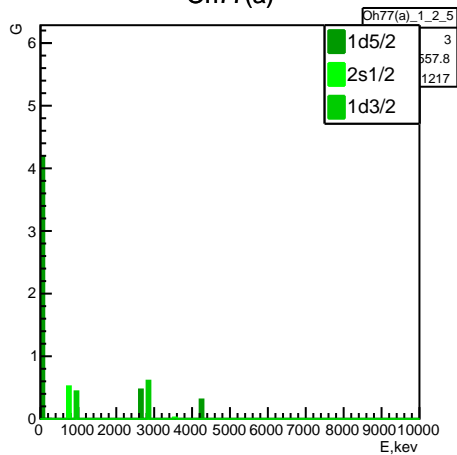
**-13461.1 1d5/2 0.629167 0.981667**

**-14139 2s1/2 0.5525 0.225**

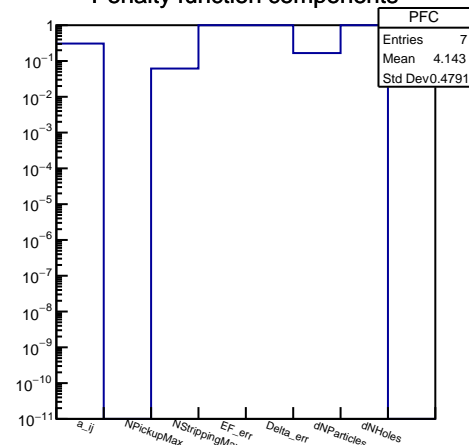
**-7902.48 1d3/2 -0.11875 1.5725**



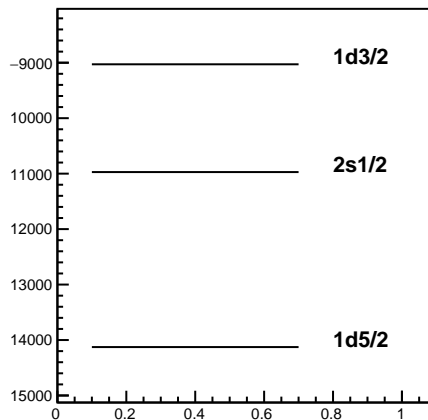
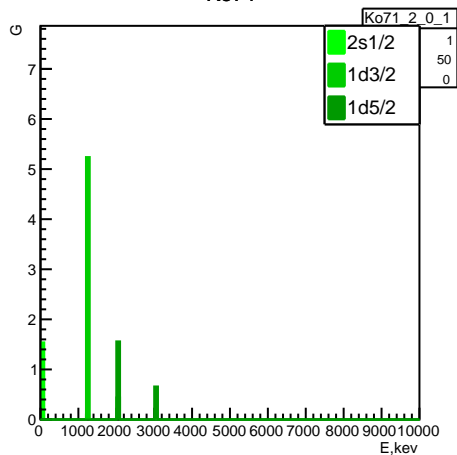
Oh77(a)



Penalty function components



Ko71



Experiment: Oh77(a) (7) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12840.5 \pm 975.51$  keV $\Delta: -2256.42 \pm 1169.11$  keV

penalty: 9.095e+09

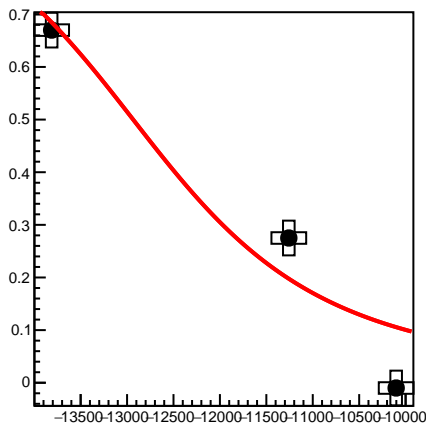
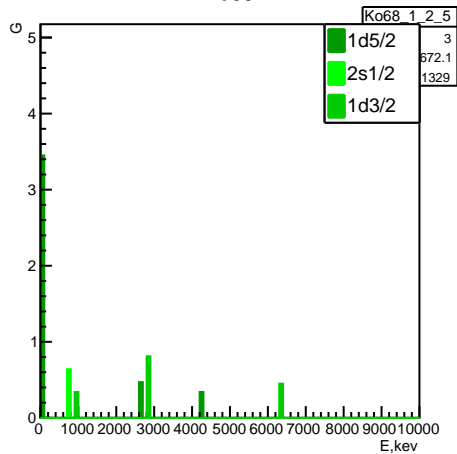
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-14126.9 1d5/2 0.729167 1.19833

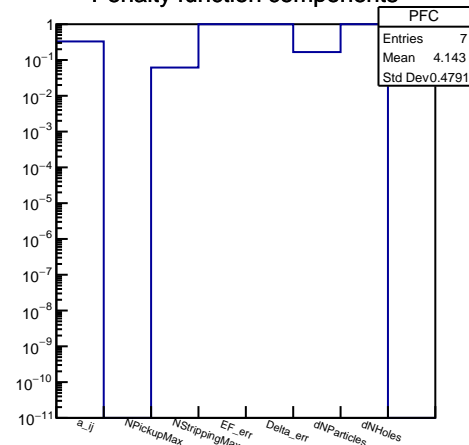
-10971.7 2s1/2 0.2505 1.041

-9028.54 1d3/2 -0.07875 1.6825

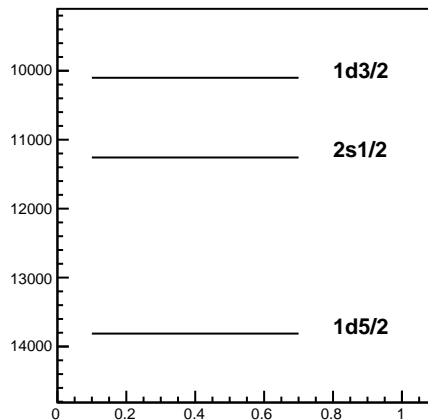
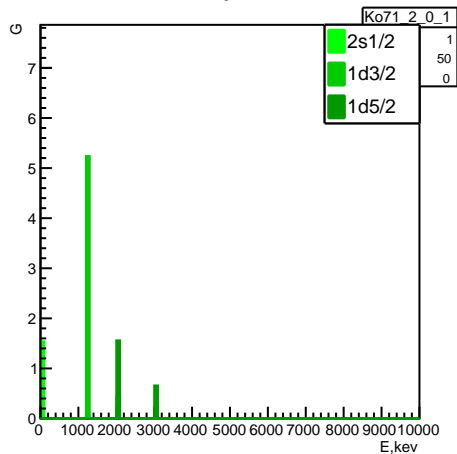
Ko68



Penalty function components



Ko71



Experiment: Ko68 (7) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12934.5 ± 654.477 keV

Δ: 2207.75 ± 981.786 keV

penalty: 9.095e+09

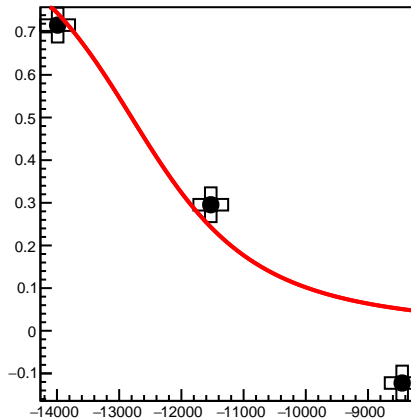
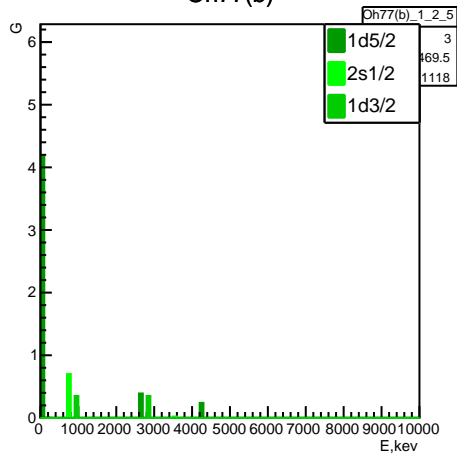
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13812.4 1d5/2 0.67 1.08

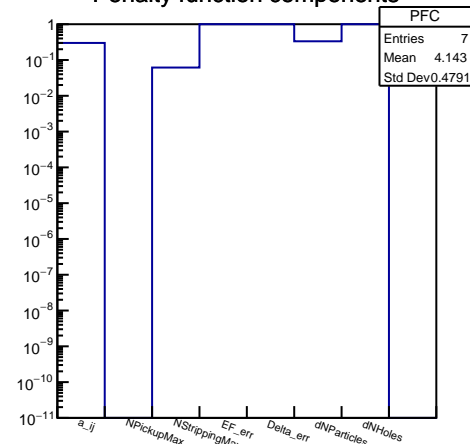
-11257.9 2s1/2 0.275 1.09

-10101.8 1d3/2 -0.01 1.82

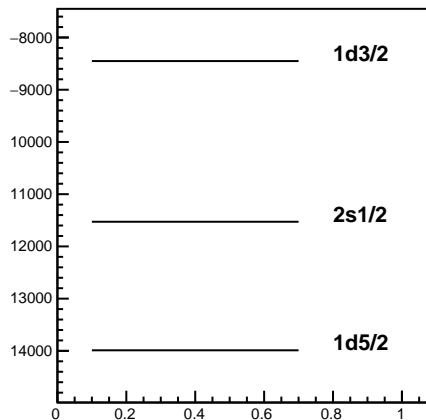
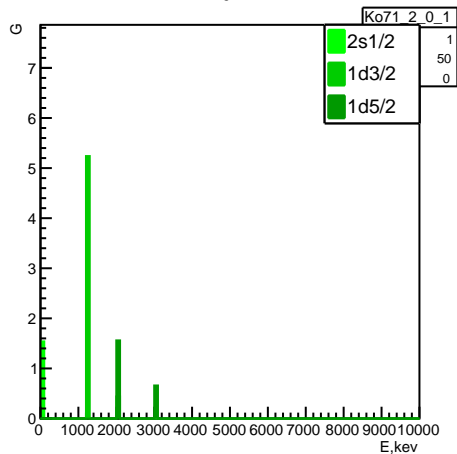
Oh77(b)



Penalty function components



Ko71



Experiment: Oh77(b) (7) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -12800 \pm 903.334$  keV $\Delta: -2125.71 \pm 1219.98$  keV

penalty: 9.095e+09

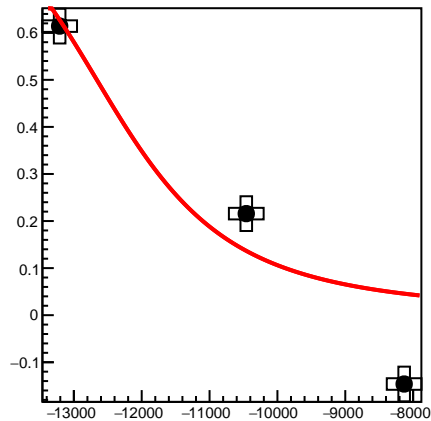
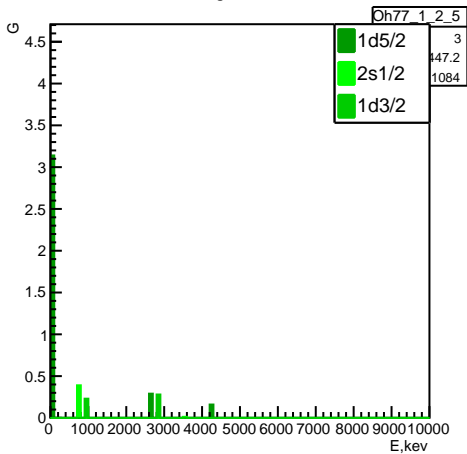
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13989.2 1d5/2 0.716667 1.17333

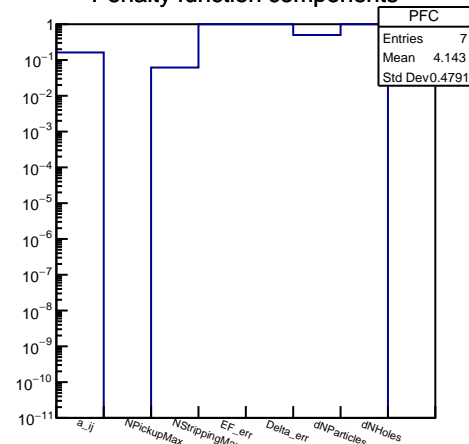
-11527.7 2s1/2 0.2955 1.131

-8451.12 1d3/2 -0.1225 1.595

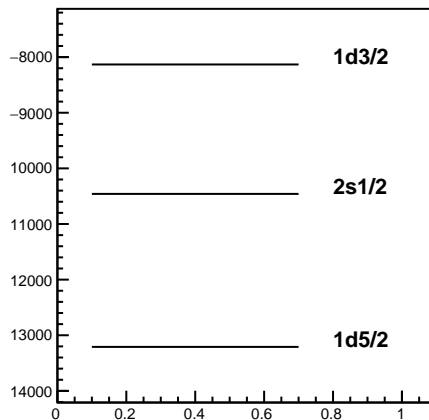
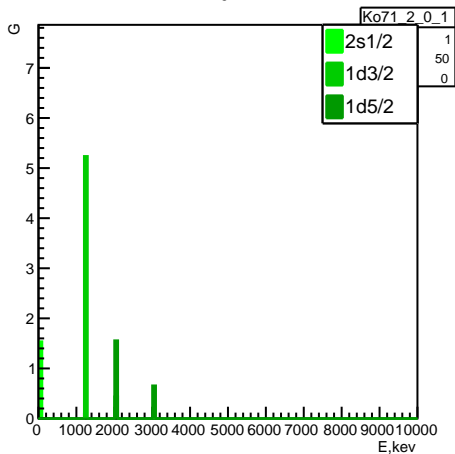
Oh77



Penalty function components



Ko71



Experiment: Oh77 (7) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12661.4 ± 952.14 keV

Δ: 2081.72 ± 1730.2 keV

penalty: 9.095e+09

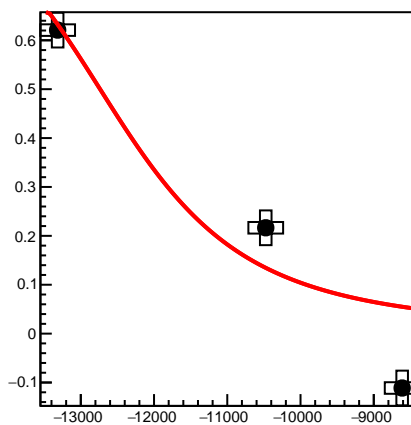
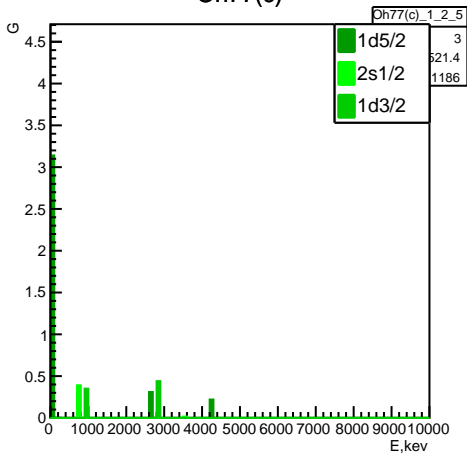
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13209.3 1d5/2 0.614167 0.968333

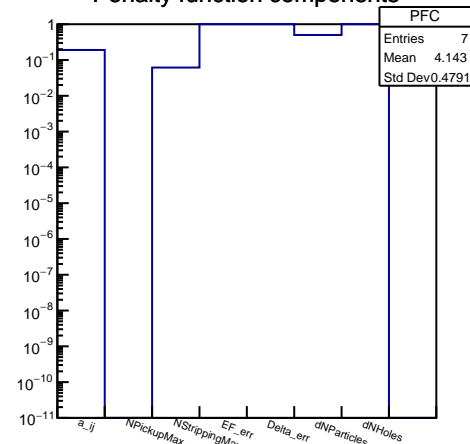
-10459 2s1/2 0.21575 0.9715

-8132.26 1d3/2 -0.14625 1.5475

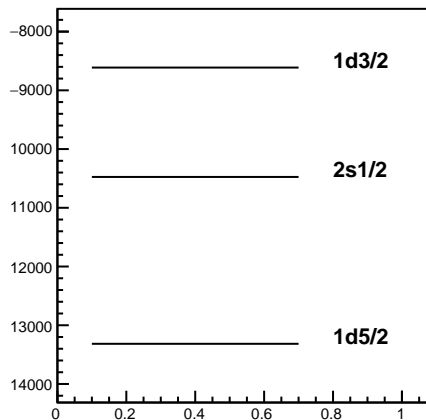
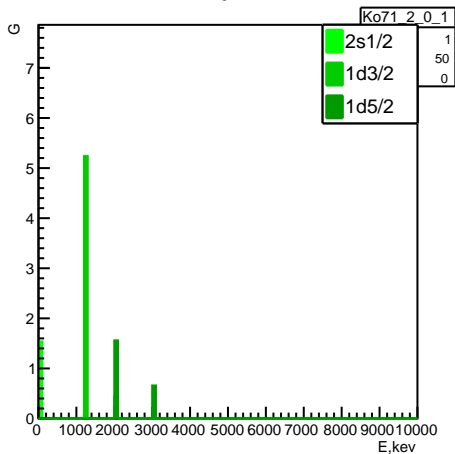
Oh77(c)



Penalty function components



Ko71



Experiment: Oh77(c) (7) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12736.4  $\pm$  865.012 keV $\Delta$ : 2111.51  $\pm$  1553.85 keV

penalty: 9.095e+09

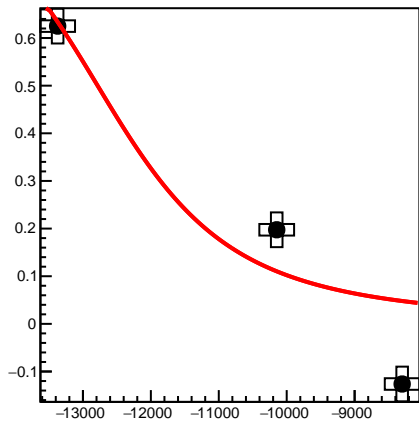
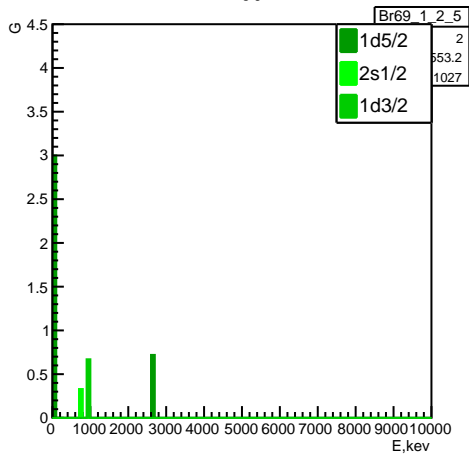
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-13315.9 1d5/2 0.620833 0.981667

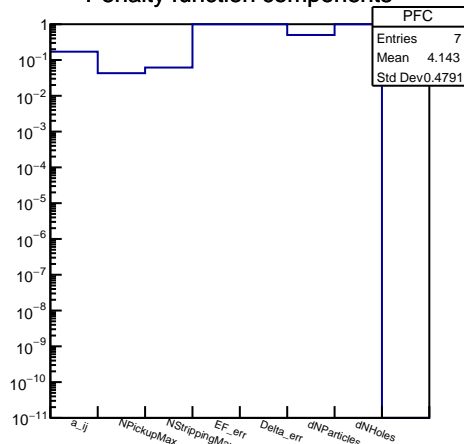
-10474.8 2s1/2 0.2165 0.973

-8612.4 1d3/2 -0.11125 1.6175

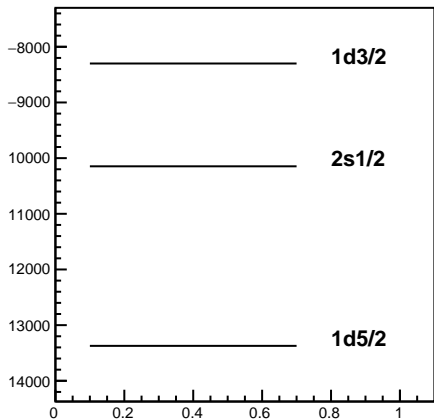
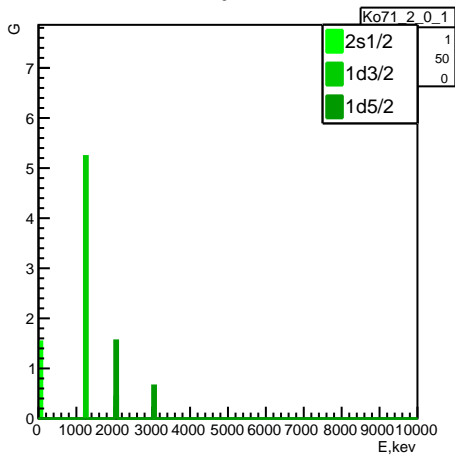
Br69



Penalty function components



Ko71



Experiment: Br69 (4) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -12783.9  $\pm$  964.898 keV

$\Delta$ : 2119.56  $\pm$  1842.81 keV

penalty: 9.095e+09

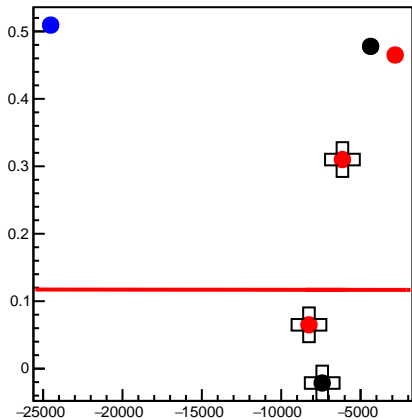
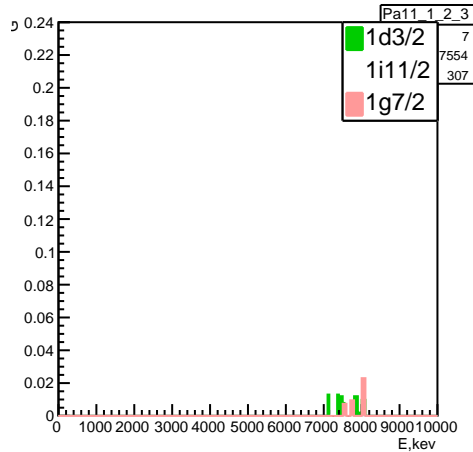
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13372.3 1d5/2 0.625 0.99

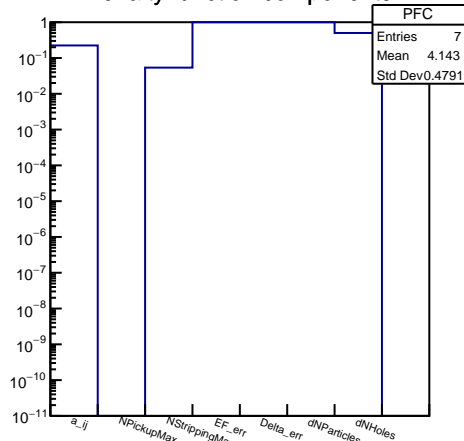
-10147 2s1/2 0.1975 0.935

-8300.15 1d3/2 -0.12625 1.5875

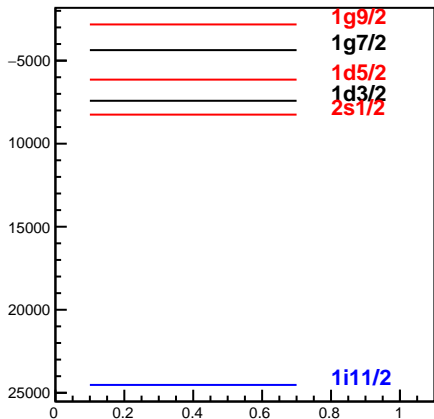
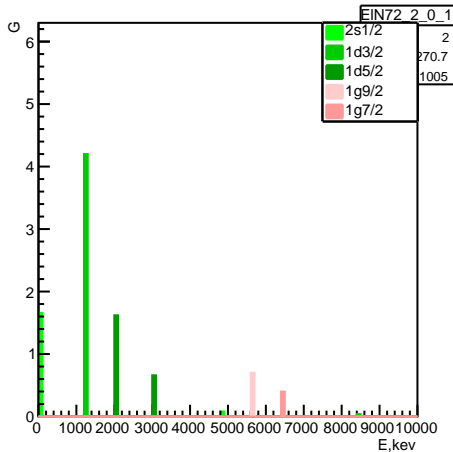
Pa11



Penalty function components



EIN72



Experiment: Pa11 (13) EIN72 (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -6.73162e+06 \pm 9.49027e+07$  keV $\Delta: 5.63839e+06 \pm 7.90996e+07$  keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-7417.06 1d3/2 -0.0212875 1.07743

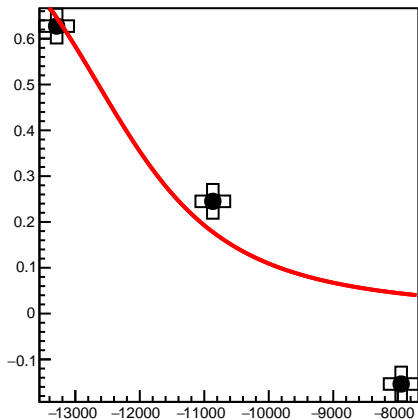
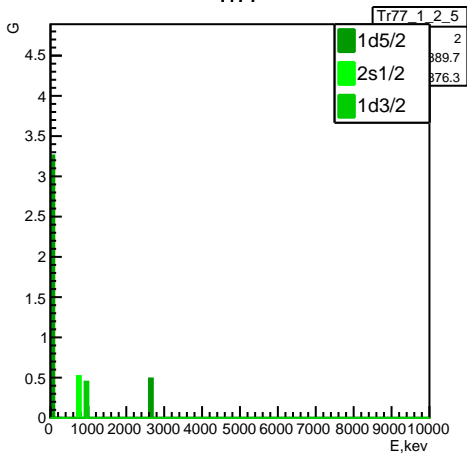
-24525.5 1i11/2 0.509333 0.87

-4366.96 1g7/2 0.4778 0.38

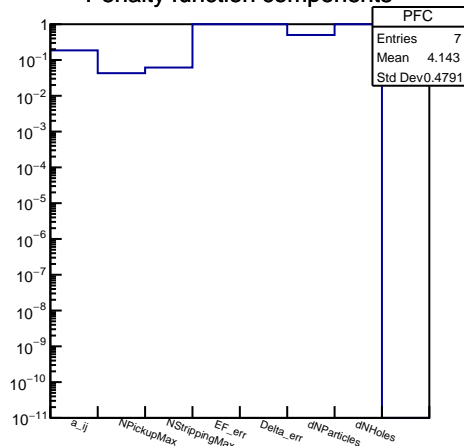
-8250.33 2s1/2 0.065 3.21143e-322

-6143.62 1d5/2 0.31 0.224192

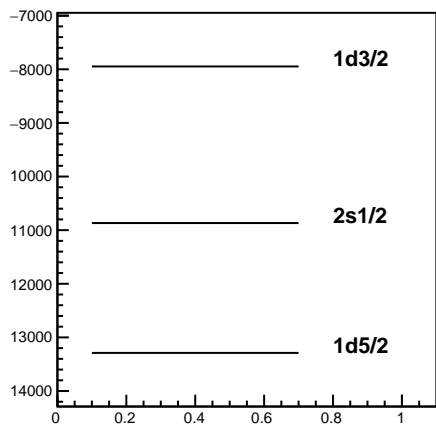
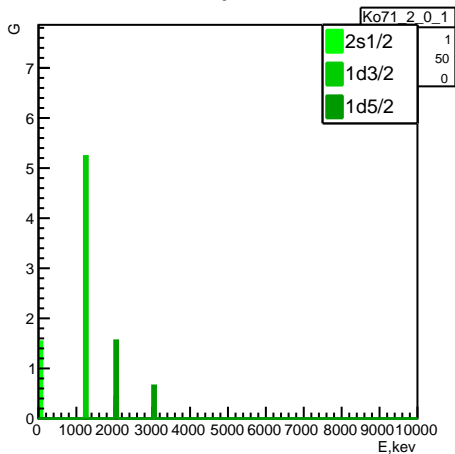
Tr77



Penalty function components



Ko71



Experiment: Tr77 (4) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F:  $-12643.9 \pm 945.215$  keV

$\Delta$ :  $2109.89 \pm 1564.01$  keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

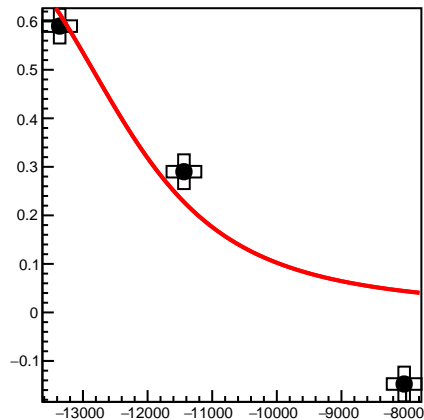
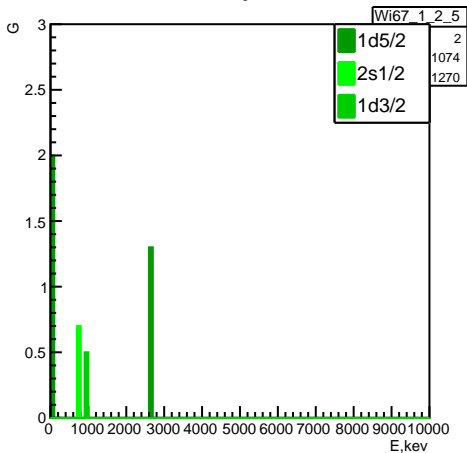
-13289.4 1d5/2 0.6275 0.995

-10867.6 2s1/2 0.245 1.03

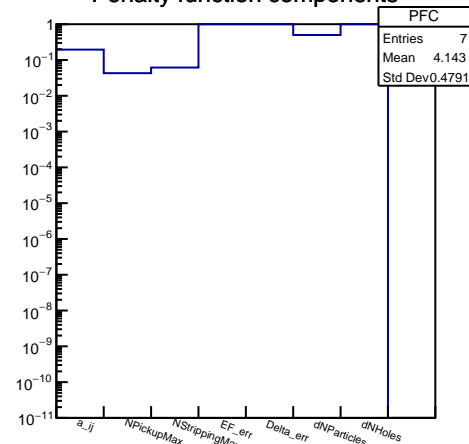
-7947.15 1d3/2 -0.15375 1.5325



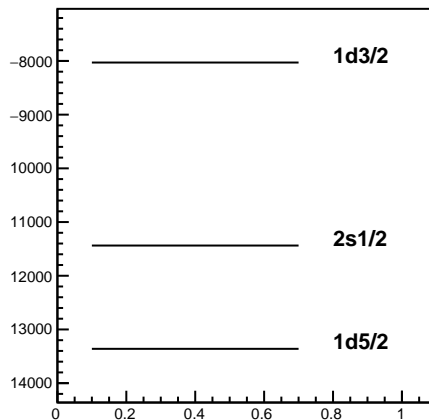
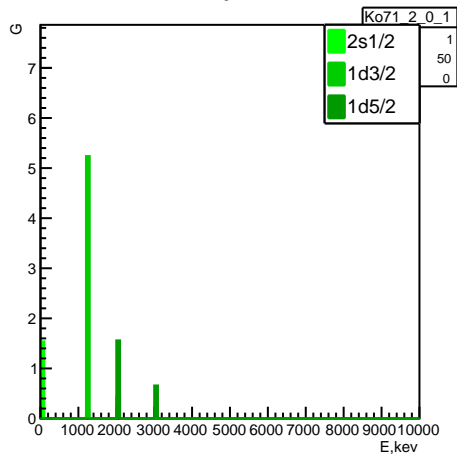
Wi67



Penalty function components



Ko71



Experiment: Wi67 (4) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F:  $-12846.6 \pm 842.896$  keV

$\Delta$ :  $-2169.74 \pm 1560.79$  keV

penalty: 9.095e+09

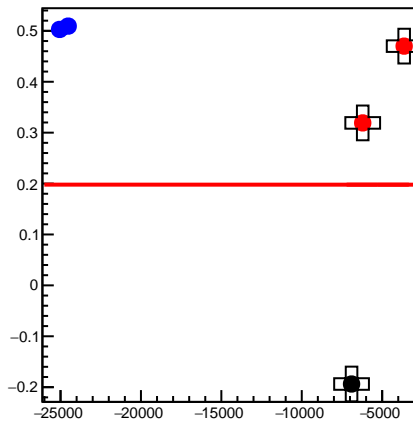
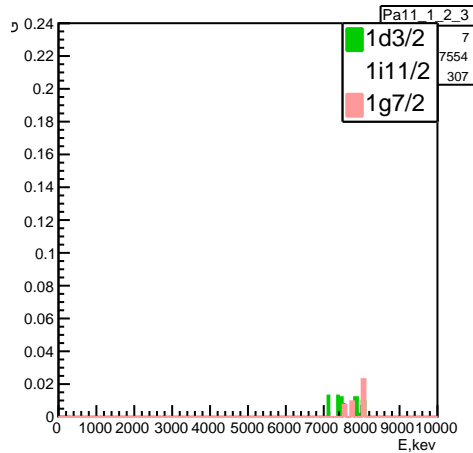
SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-13360.9 1d5/2 0.59 0.92

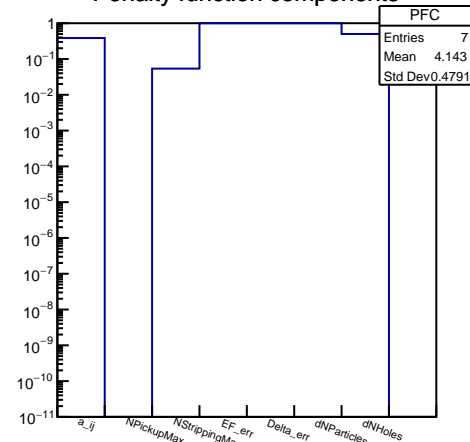
-11437.4 2s1/2 0.29 1.12

-8029.59 1d3/2 -0.1475 1.545

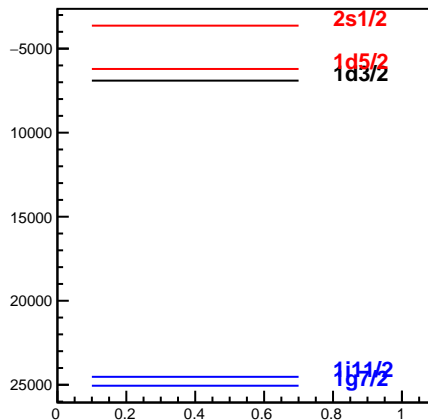
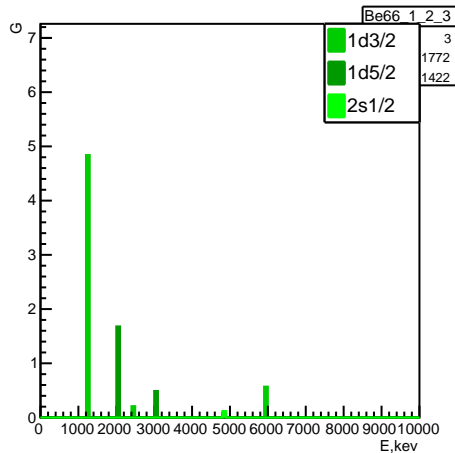
Pa11



Penalty function components



Be66



Experiment: Pa11 (13) Be66 (6)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ : -5.41018e+07  $\pm$  1.27137e+09 keV $\Delta$ : -7.13136e+07  $\pm$  1.67028e+09 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6903.78 1d3/2 -0.193788 1.42243

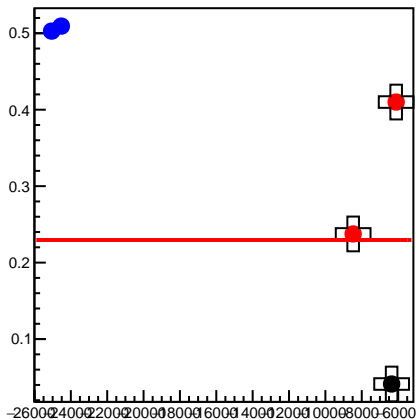
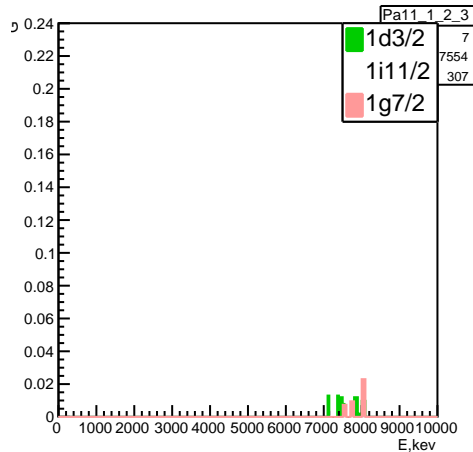
-24525.5 1i11/2 0.509333 0.361667

-25055.3 1g7/2 0.5028 0.06

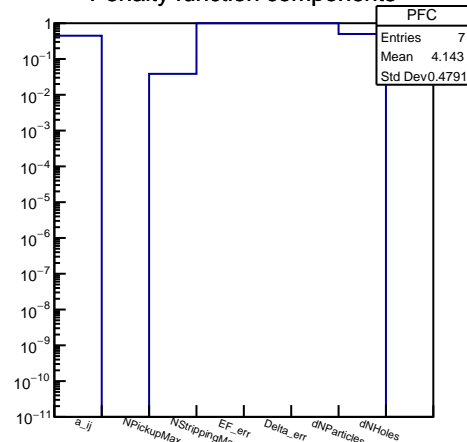
-6209.72 1d5/2 0.319167 5.58294e-322

-3632.67 2s1/2 0.47 6.92655e-310

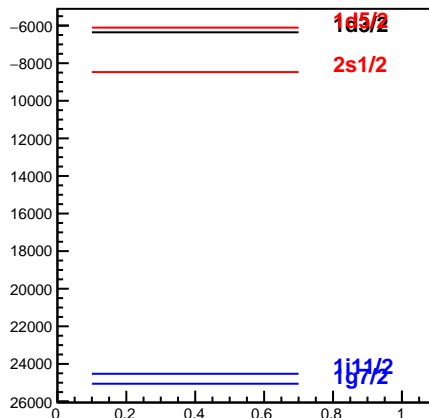
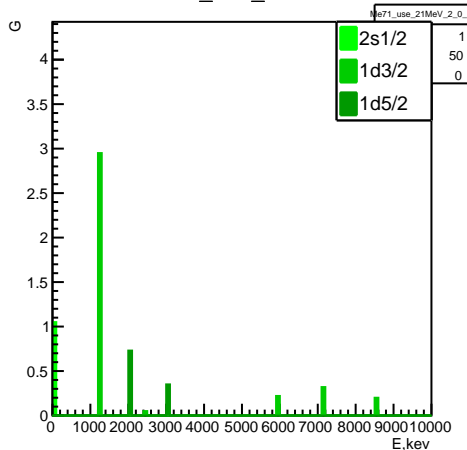
Pa11



Penalty function components



Me71\_use\_21MeV



Experiment: Pa11 (13) Me71\_use\_21MeV (8)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -7.65907e+08 ± 1.47733e+10 keV

Δ: -1.19109e+09 ± 2.29744e+10 keV

penalty: 9.095e+09

SPE,kev nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-6357.04 1d3/2 0.0412125 0.952425

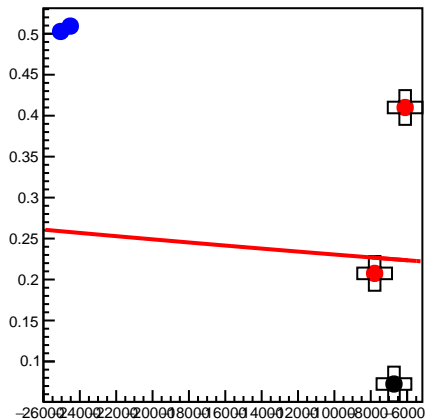
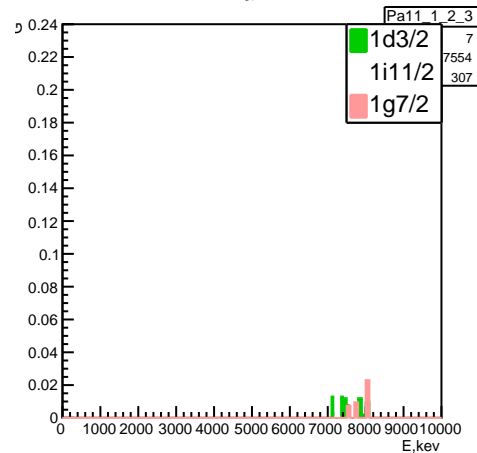
-24525.5 1i11/2 0.509333 0.525

-25055.3 1g7/2 0.5028 0.18

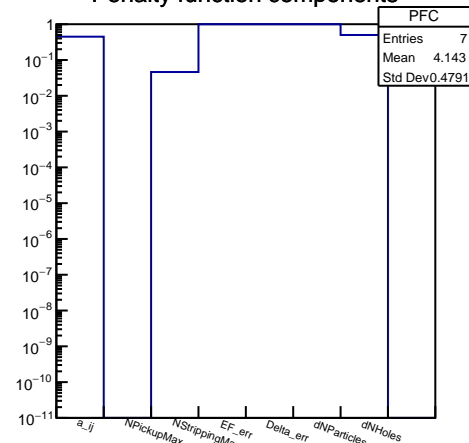
-8472.87 2s1/2 0.2375 5.58294e-322

-6107.7 1d5/2 0.41 6.92655e-310

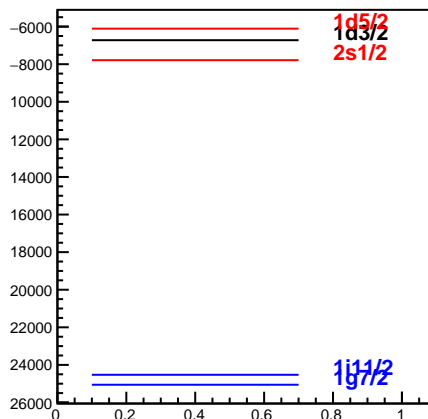
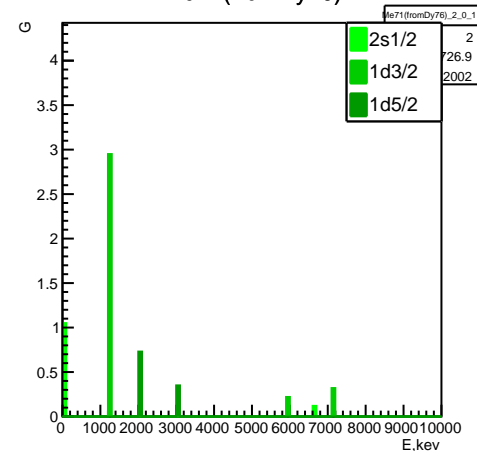
Pa11



Penalty function components



Me71(fromDy76)



Experiment: Pa11 (13) Me71(fromDy76) (7)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -117429  $\pm$  1.3291e+06 keV

$\Delta$ : 167904  $\pm$  1.97071e+06 keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-6723.34 1d3/2 0.0724625 0.889925

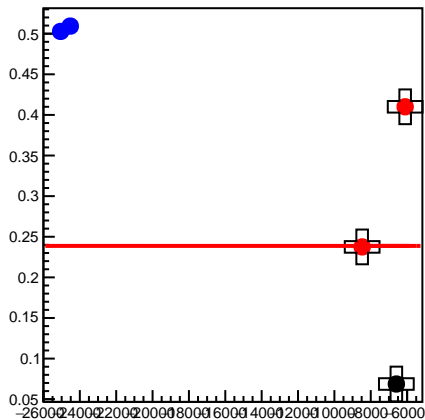
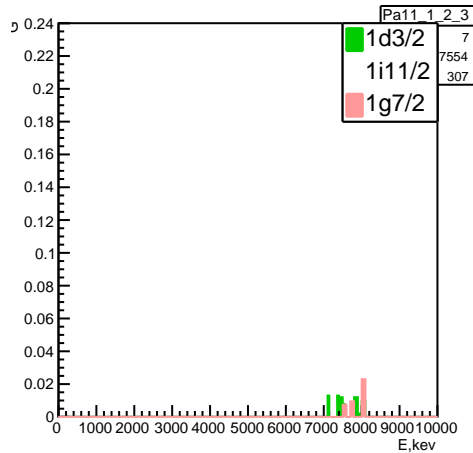
-24525.5 1i11/2 0.509333 0.585

-25055.3 1g7/2 0.5028 0.18

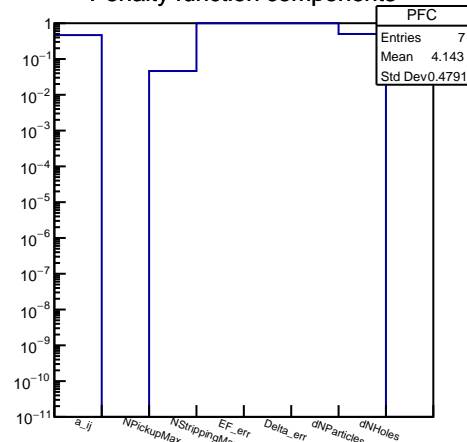
-7786.11 2s1/2 0.2075 5.58294e-322

-6107.7 1d5/2 0.41 6.92655e-310

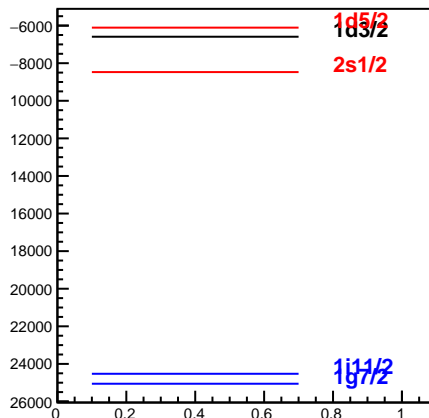
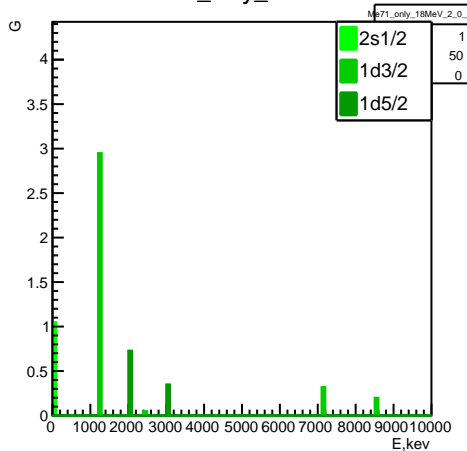
Pa11



Penalty function components



Me71\_only\_18MeV



Experiment: Pa11 (13) Me71\_only\_18MeV (7)  
neutron transfer

n separation energy A:17178.6, A+1: 8472.87

E\_F: -9.7668e+08  $\pm$  1.06701e+10 keV

$\Delta$ : -1.59367e+09  $\pm$  1.74205e+10 keV

penalty: 9.095e+09

SPE,kev nlj OCC  $\frac{G^+ + G^-}{2J+1}$

-6591.84 1d3/2 0.0687125 0.897425

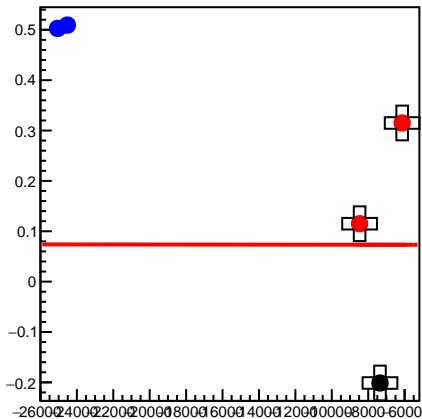
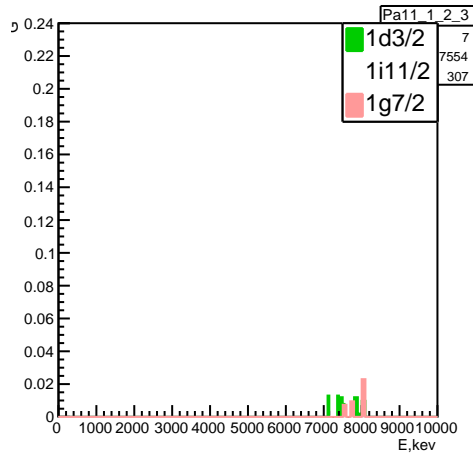
-24525.5 1i11/2 0.509333 0.525

-25055.3 1g7/2 0.5028 0.18

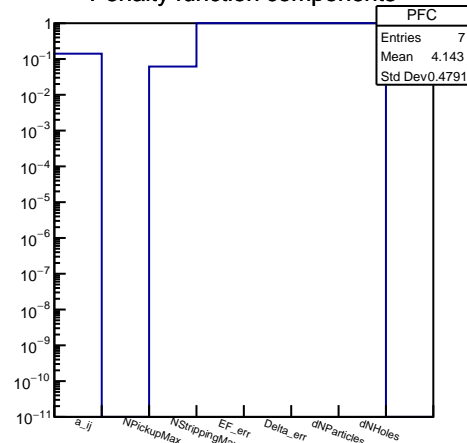
-8472.87 2s1/2 0.2375 2.29741e-321

-6107.7 1d5/2 0.41 6.92655e-310

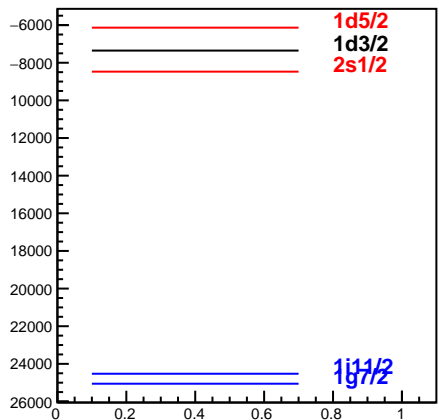
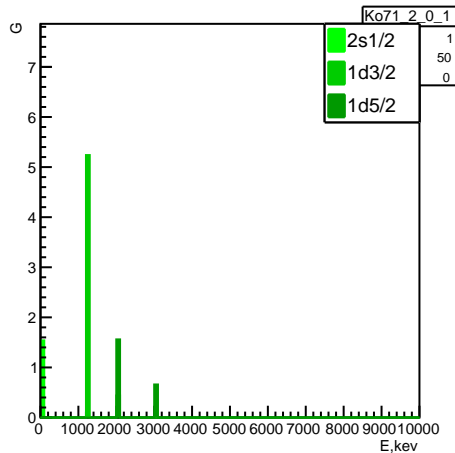
Pa11



Penalty function components



Ko71



Experiment: Pa11 (13) Ko71 (5)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F$ :  $-3.13342e+06 \pm 9.3412e+07$  keV $\Delta$ :  $1.90775e+06 \pm 5.55249e+07$  keV

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-7353.4 1d3/2 -0.201288 1.43743

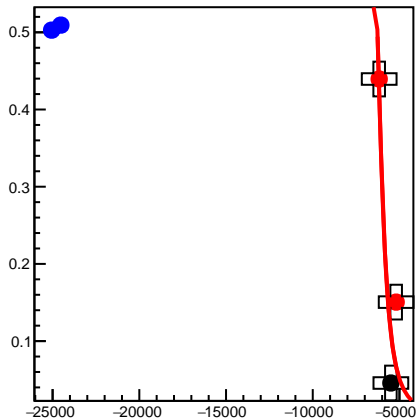
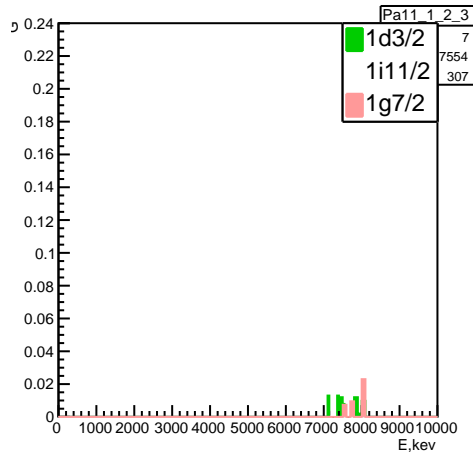
-24525.5 1i11/2 0.509333 0.77

-25055.3 1g7/2 0.5028 0.37

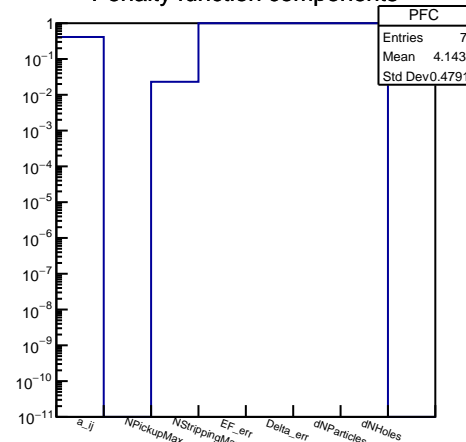
-8472.87 2s1/2 0.115 5.58294e-322

-6135.5 1d5/2 0.315 6.92655e-310

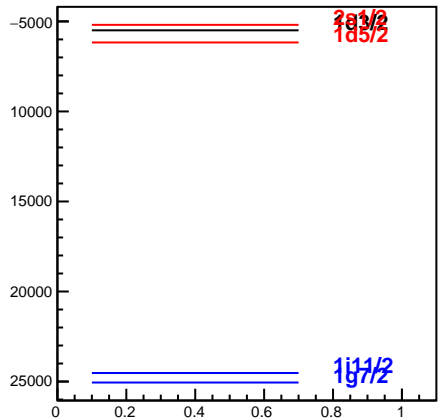
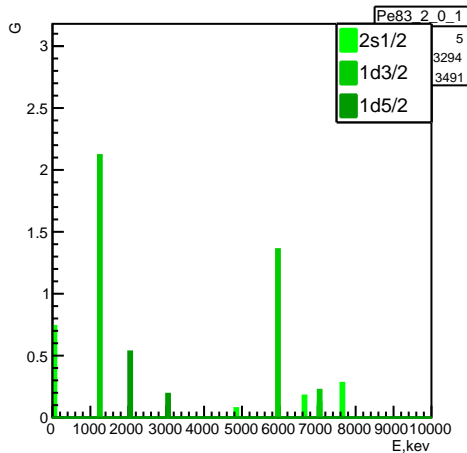
Pa11



Penalty function components



Pe83



Experiment: Pa11 (13) Pe83 (10)

neutron transfer

n separation energy A:17178.6, A+1: 8472.87

 $E_F: -6268.78 \pm 187.304 \text{ keV}$  $\Delta: 621.281 \pm 471.808 \text{ keV}$ 

penalty: 9.095e+09

SPE,keV nlj OCC  $\frac{G^+ + G^-}{2J+1}$ 

-5495.14 1d3/2 0.0457125 0.943425

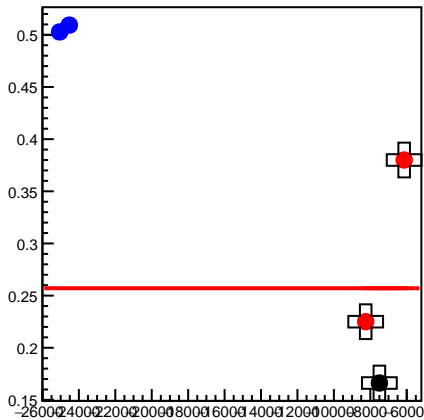
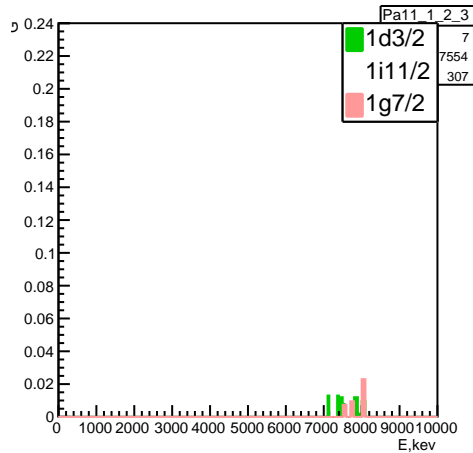
-24525.5 1i11/2 0.509333 0.699

-25055.3 1g7/2 0.5028 0.121

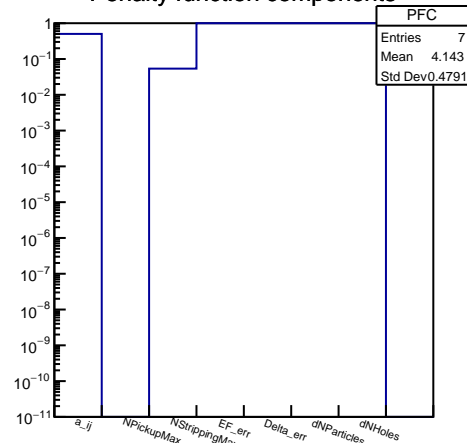
-5190.57 2s1/2 0.1505 5.58294e-322

-6169.59 1d5/2 0.4395 6.92655e-310

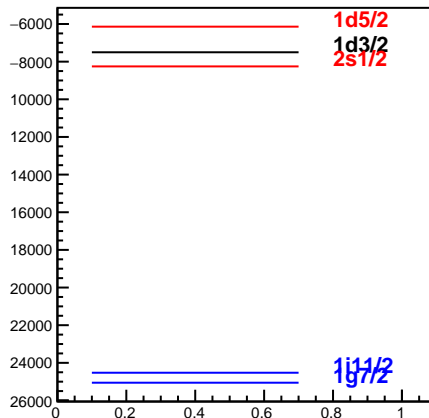
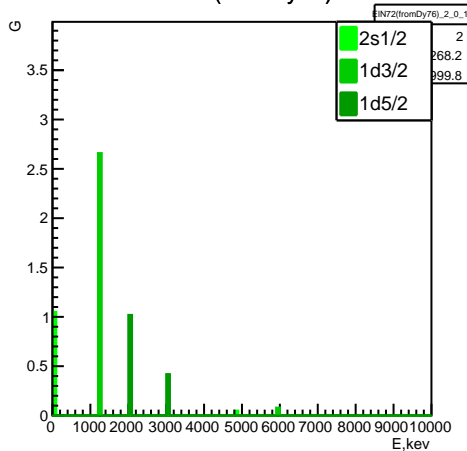
Pa11



Penalty function components



EIN72(fromDy76)



Experiment: Pa11 (13) EIN72(fromDy76) (6)  
 neutron transfer  
 n separation energy A:17178.6, A+1: 8472.8  
 $E_F$ : -2.1964e+09  $\pm$  1.68874e+10 keV  
 $\Delta$ : -3.95123e+09  $\pm$  3.04066e+10 keV  
 penalty: 9.095e+09  
 $SPE, keV \ nlj \ OCC \ \frac{G^+ + G^-}{2J+1}$   
 -7501.83 1d3/2 0.166212 0.702425  
 -24525.5 1i11/2 0.509333 0.55  
 -25055.3 1g7/2 0.5028 0.24  
 -8252.86 2s1/2 0.225 4.11557e-321  
 -6141.35 1d5/2 0.38 0.257072