Образование p-нуклидов в фотоядерных реакциях.

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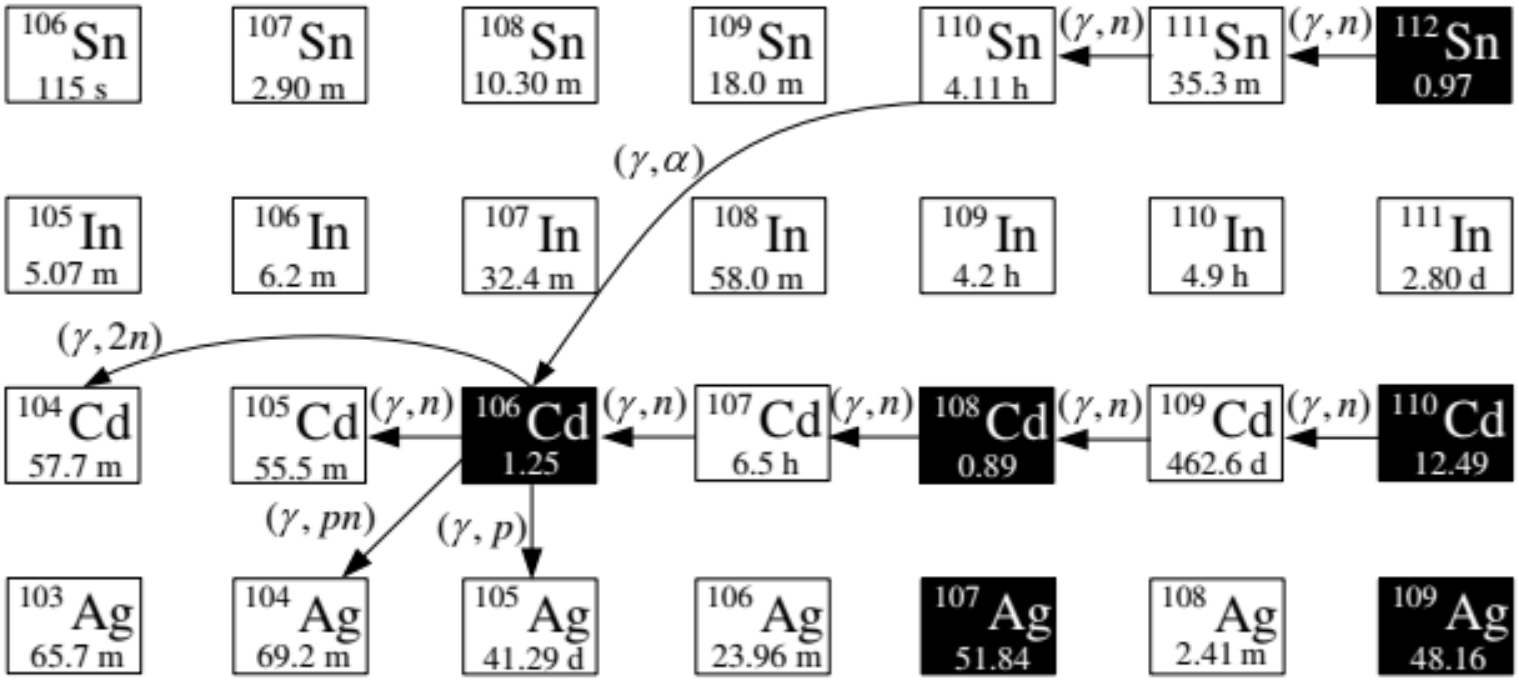
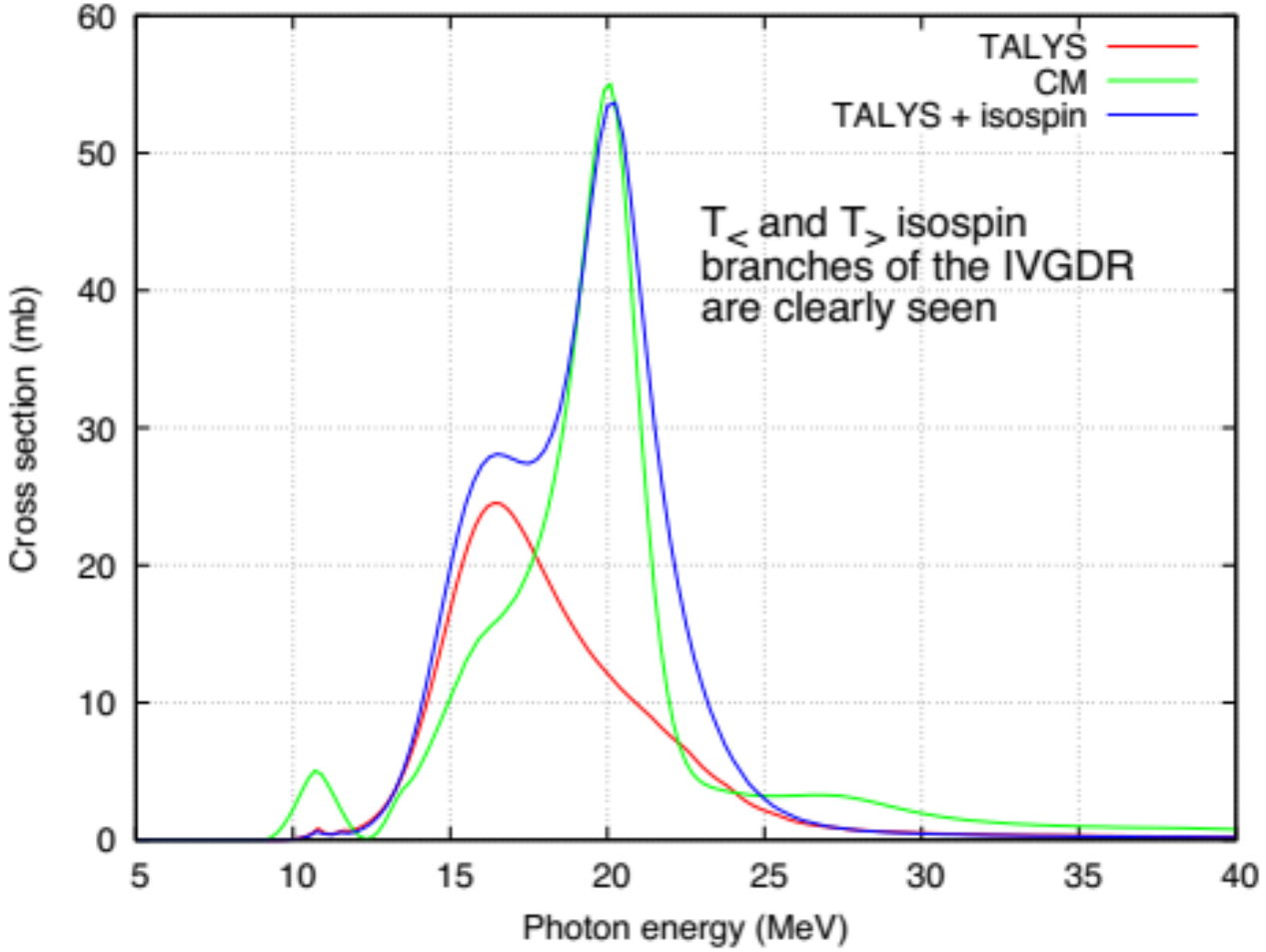
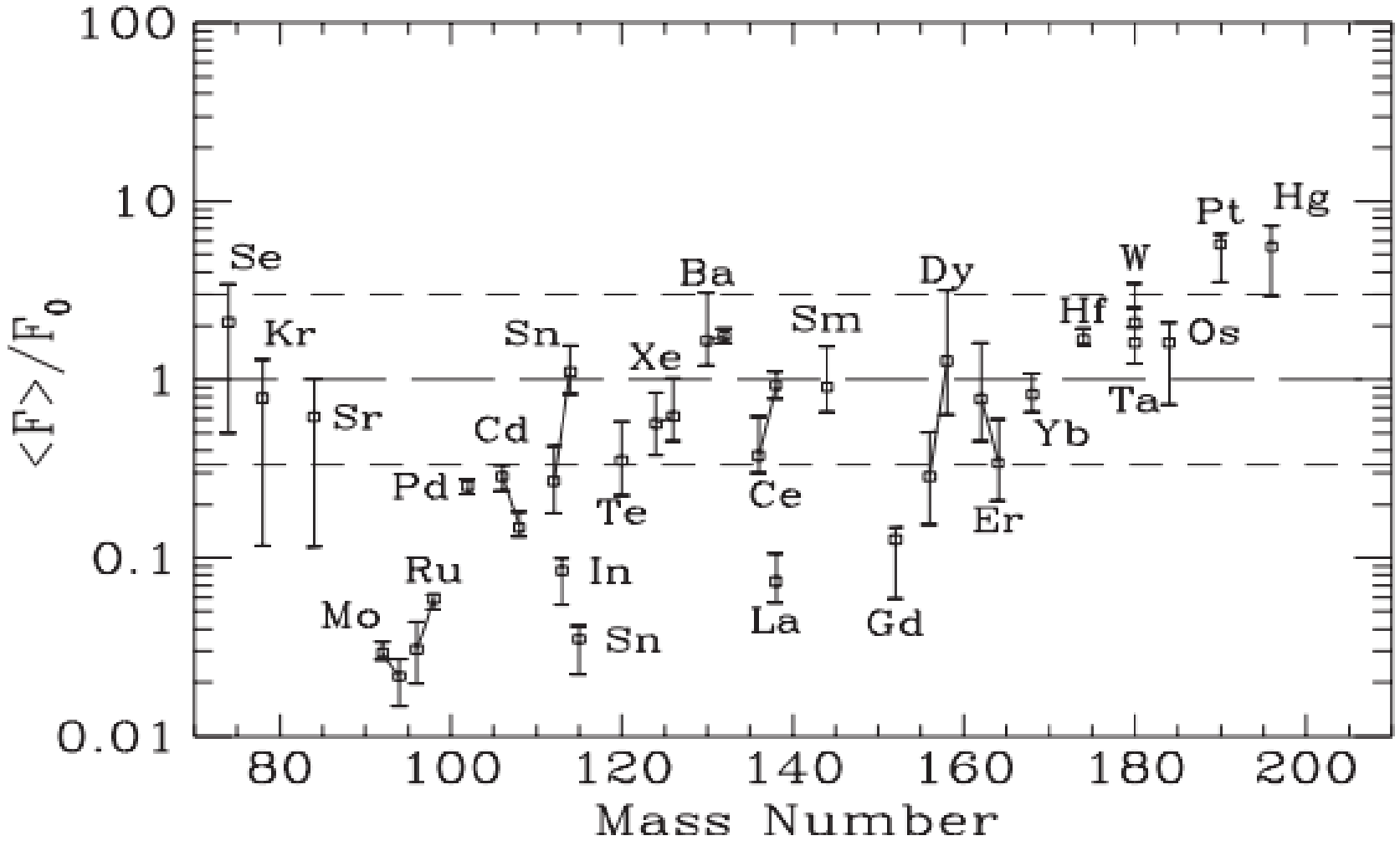


	$(\gamma, n)^{105}Cd$	$(\gamma, p)^{105}Ag$
	Experiment	
σ_q, mb	31 ± 1	46 ± 4
Y, $1/\mu C$	$(3.0 \pm 0.1) \cdot 10^7$	$(4.4 \pm 0.4) \cdot 10^7$
	Models	
Y, TALYS	$(6.4 \pm 0.9) \cdot 10^7$	$(0.73 \pm 0.01) \cdot 10^7$
Y, CM	$(7.0 \pm 0.1) \cdot 10^7$	$(1.04 \pm 0.01) \cdot 10^7$
Y, TALYS+isospin	$(6.61 \pm 0.09) \cdot 10^7$	$(1.27 \pm 0.02) \cdot 10^7$

Model cross sections

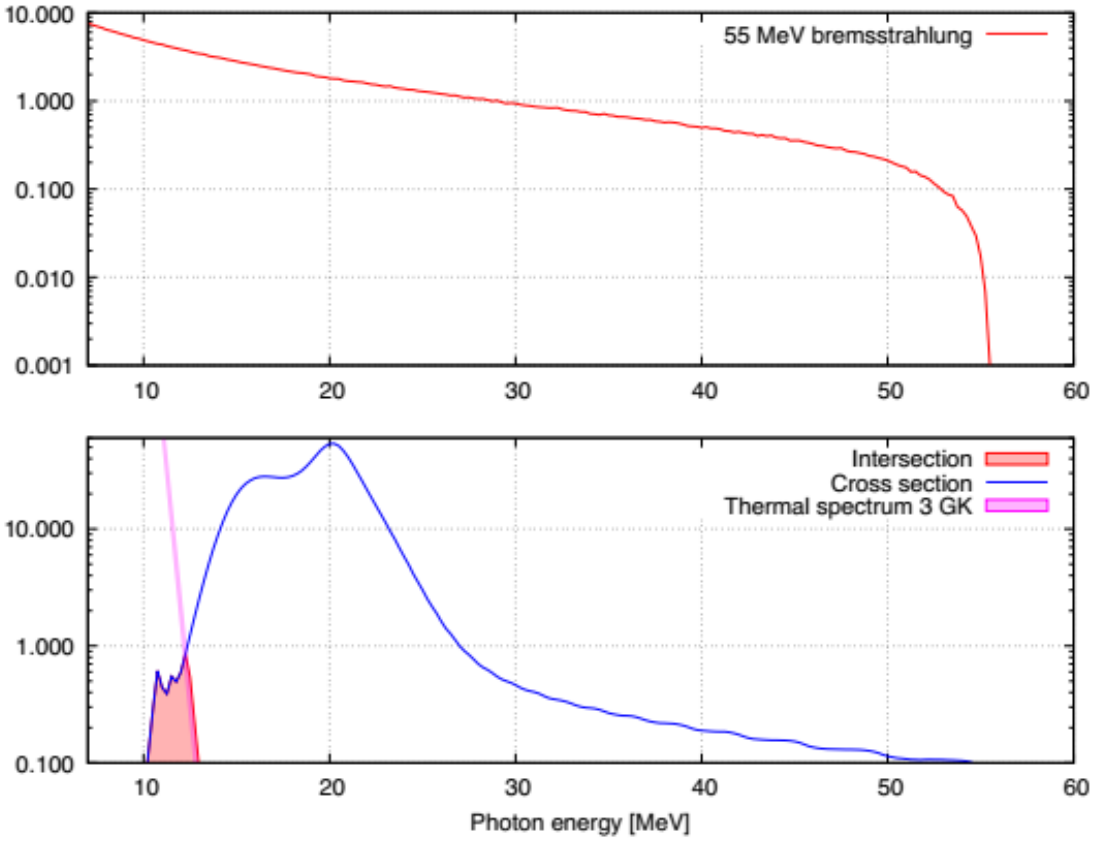
^{106}Cd(γ, p) reaction

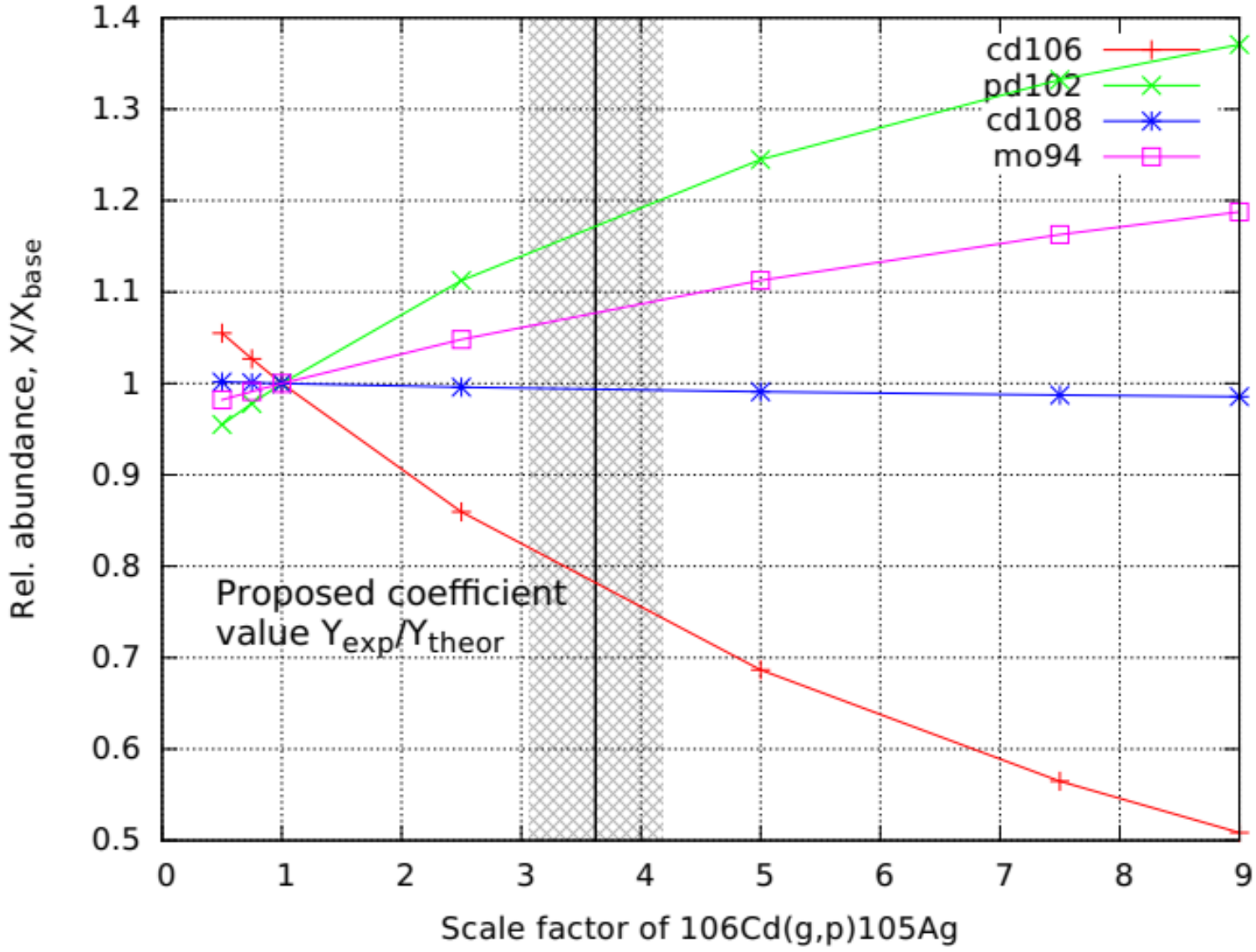


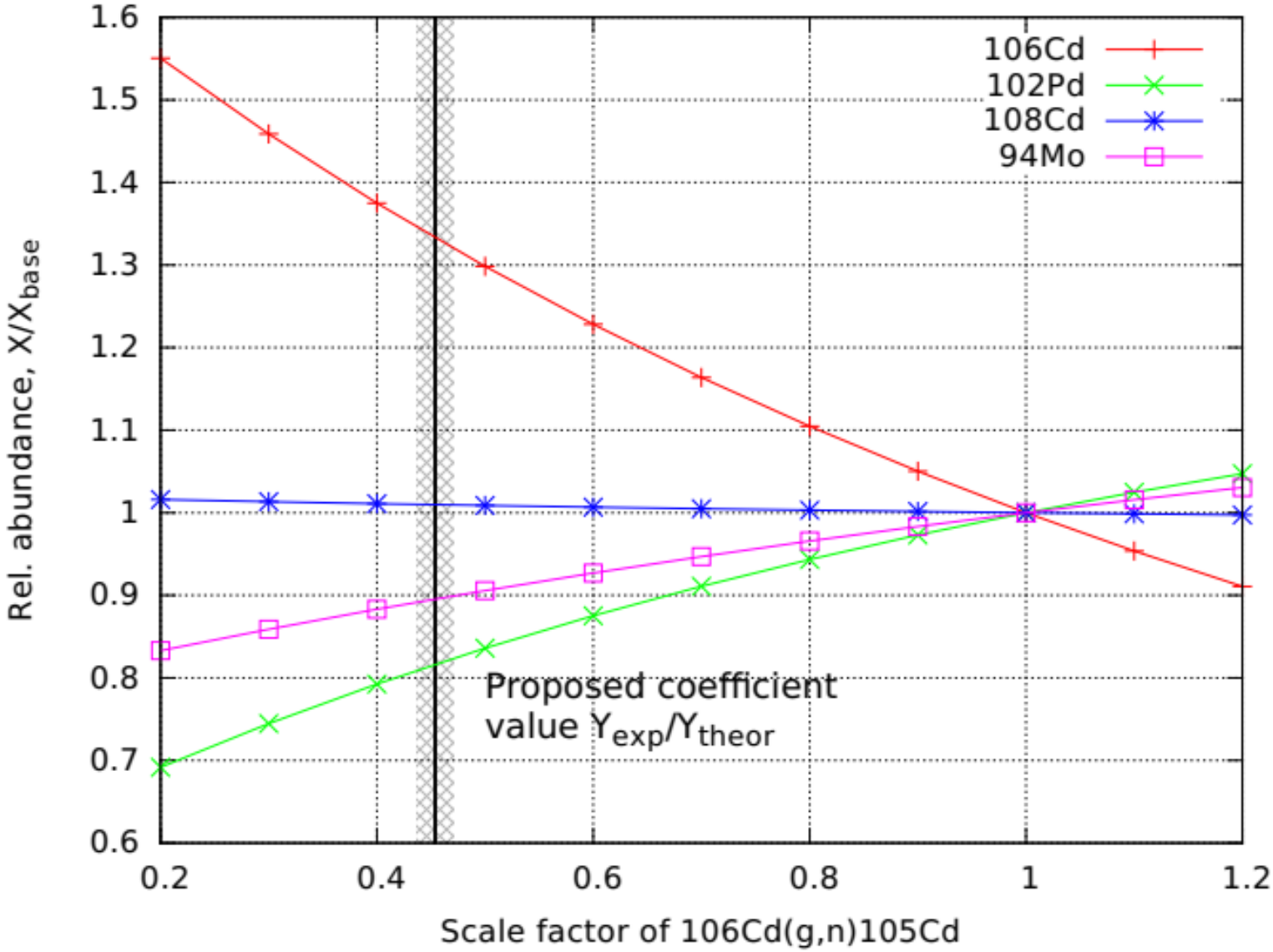

100
10
1
0.1
0.01
<F>/F0
80
100
120
140
160
180
200
Mass Number
Se
Kr
Sr
Ru
Mo
Pd
Cd
Sn
In
Sn
Te
Xe
Ba
Ce
La
Sm
Gd
Dy
Er
Yb
Hf
Ta
W
Os
Pt
Hg

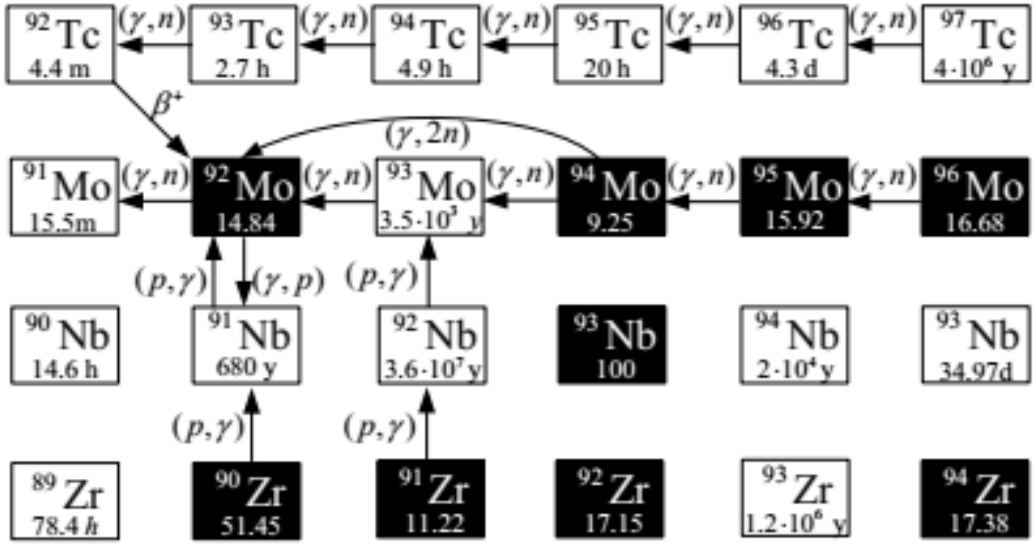
$$\lambda^{\mu}_{(\gamma,\alpha)}(T) = \int_0^{\infty} c\, n_\gamma(E,T)\, \sigma^{\mu}_{(\gamma,\alpha)}(E)\, dE\,,$$

$$\lambda^{*}_{(\gamma,j)}(T) = \frac{\sum_\mu (2J^\mu + 1)\ \lambda^{\mu}_{(\gamma,\alpha)}(T)\ \exp(-E^\mu_x/kT)}{\sum_\mu (2J^\mu + 1)\ \exp(-E^\mu_x/kT)}$$




cd106
pd102
cd108
mo94
Proposed coefficient
value Yexp/Ytheor
Rel. abundance, X/Xbase
Scale factor of 106Cd(g,p)105Ag
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0
1
2
3
4
5
6
7
8
9


1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.2
0.4
0.6
0.8
1
1.2
Rel. abundance, X/X_base
Scale factor of 106Cd(g,n)105Cd
106Cd
102Pd
108Cd
94Mo
Proposed coefficient
value Y_exp/Y_theor



	Осн. реак.	Наст. работа, $1/e^-$	TALYS, $1/e^-$	TALYS ISO, $1/e^-$
^{90}Mo	^{92}Mo(γ,2n)	$(1.79 \pm 0.11) \cdot 10^{-7}$	$2.54 \cdot 10^{-7}$	$1.73 \cdot 10^{-7}$
^{m91}Mo	^{92}Mo(γ,n)	$(2.06 \pm 0.05) \cdot 10^{-6}$	$3.08 \cdot 10^{-6}$	$3.17 \cdot 10^{-6}$
^{91}Mo	^{92}Mo(γ,n)	$(2.11 \pm 0.18) \cdot 10^{-6}$	$1.61 \cdot 10^{-6}$	$1.55 \cdot 10^{-6}$
^{91}Mo$_{tot}$	^{92}Mo(γ,n)	$(4.17 \pm 0.19) \cdot 10^{-6}$	$4.72 \cdot 10^{-6}$	$4.72 \cdot 10^{-6}$
^{93m}Mo	^{nat}Mo(γ,xn)	$(2.40 \pm 0.10) \cdot 10^{-9}$	$4.17 \cdot 10^{-8}$	-
^{89m}Nb	^{92}Mo(γ,p2n)	$(4.71 \pm 0.18) \cdot 10^{-08}$	$1.97 \cdot 10^{-8}$	$1.33 \cdot 10^{-8}$
^{90}Nb$_{tot}$	^{92}Mo(γ,pn)	$(2.62 \pm 0.12) \cdot 10^{-07}$	$3.19 \cdot 10^{-7}$	$2.74 \cdot 10^{-7}$
^{91m}Nb	^{92}Mo(γ,p)	$(1.20 \pm 0.02) \cdot 10^{-06}$	$4.64 \cdot 10^{-6}$	$5.56 \cdot 10^{-6}$
^{92m}Nb	^{94}Mo(γ,pn)	$(1.12 \pm 0.02) \cdot 10^{-07}$	$8.93 \cdot 10^{-8}$	$1.43 \cdot 10^{-7}$

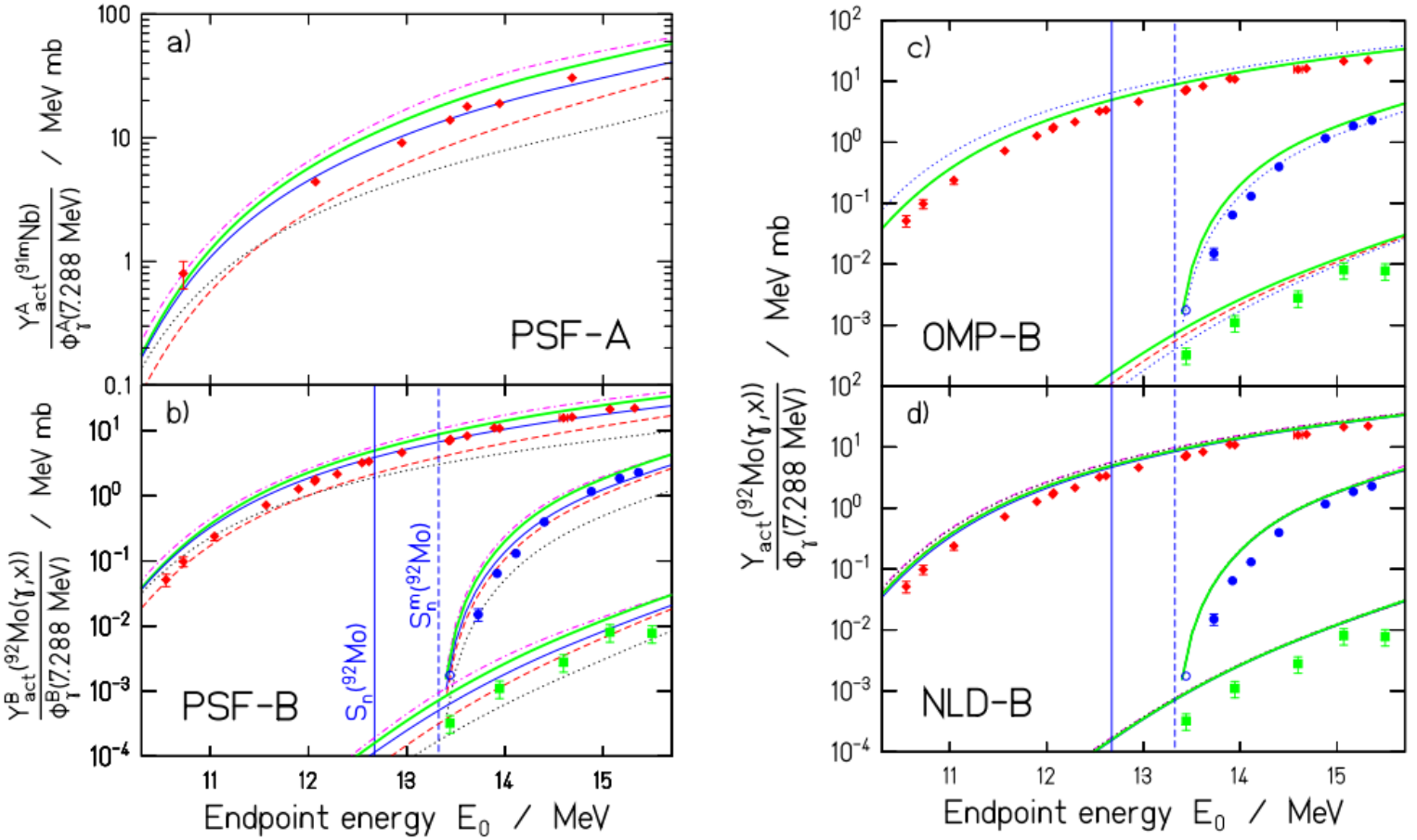


Figure 1. Photoactivation yields of ^{92}Mo(γ,p) are shown as red diamonds, (γ,n) as blue points, and (γ,α) as green squares, normalized to the photon fluence at 7.3 MeV. At activation site A (panel a)) the photon fluence is normalized with photons scattered off ^{11}B and at the irradiation site B (panel b) to d)) with the activation yield and yield integral of ^{197}Au(γ,n). The experimental data are compared with yield integrals based on different nuclear models calculated with TALYS [9]. In the two left panels the effect of different photon strength functions (PSF) is shown (details see text). Different optical model potentials (OMP) are displayed in panel b) and the variation of nuclear level density (NLD) models is given in panel d).

M Erhard et al., Photoactivation of the p-nucleus 92Mo with bremsstrahlung at ELBE // 2010 J. Phys.: Conf. Ser. 202 012014

Спасибо за внимание!