

Compton scattering

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Inhaltsverzeichnis

Theoretical background

Experimental setup

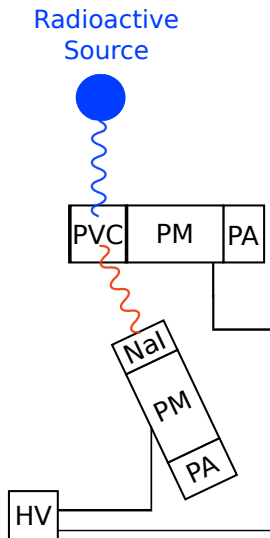
^{137}Cs und ^{22}Na samples

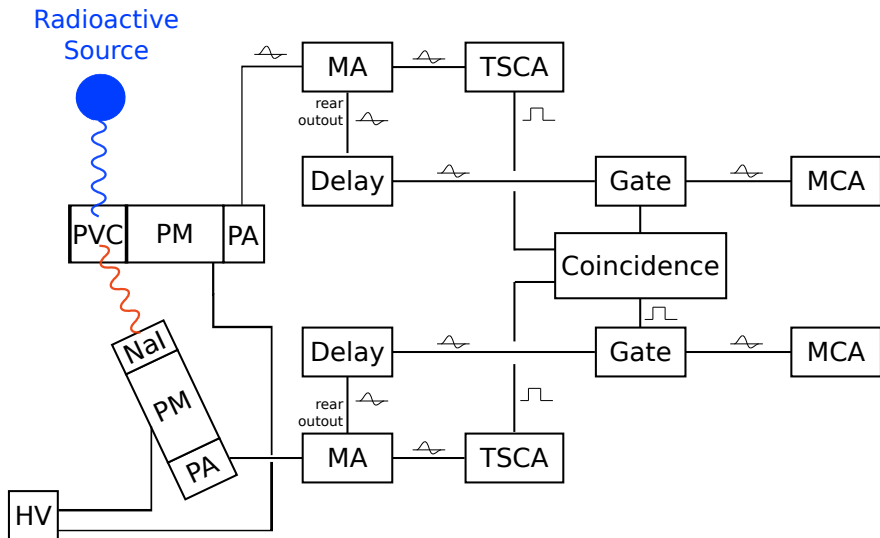
Szintillatoren

Calibration of PS scintillator

Calibration of Na scintillator

Energy Conservation





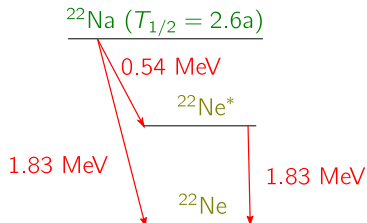
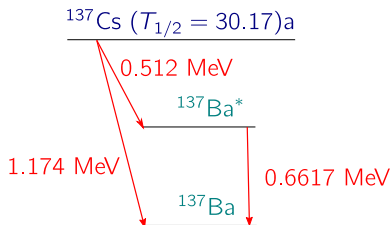
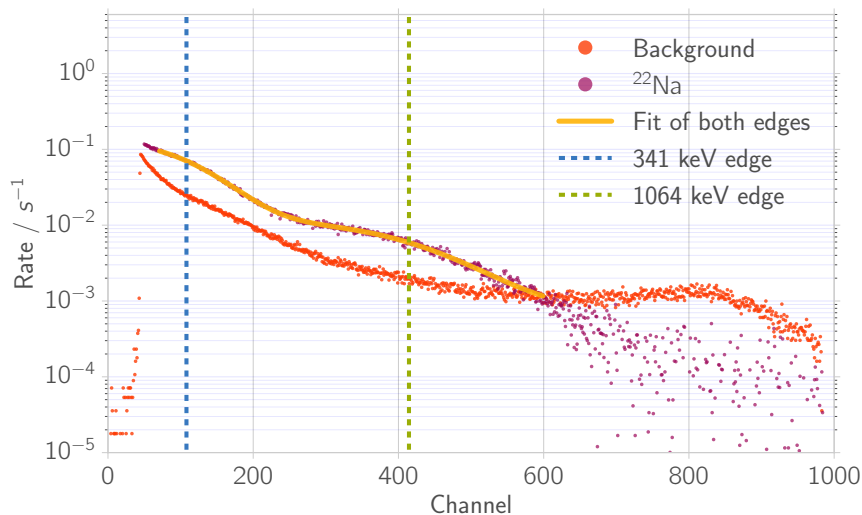
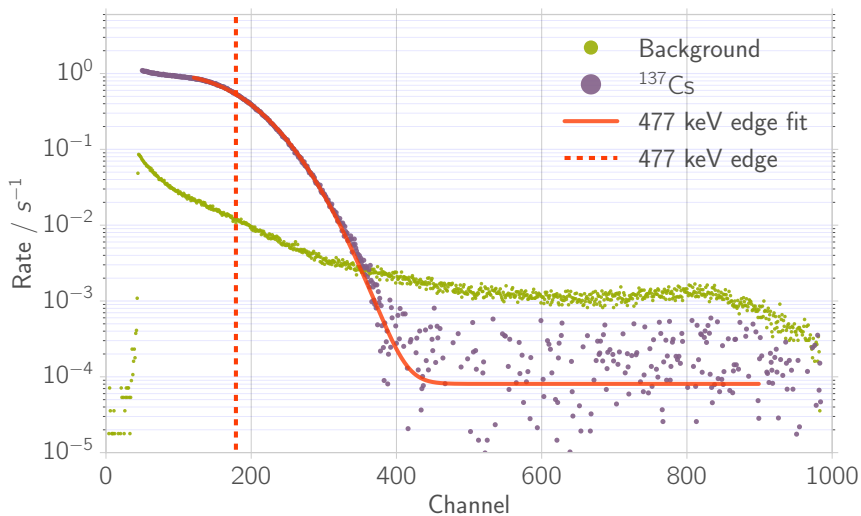


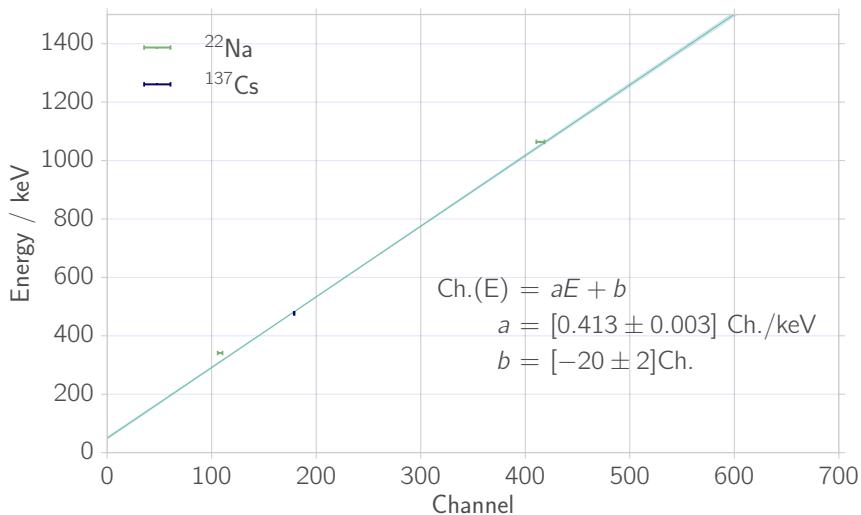
Table: Sichtbare Peaks und Kanten (Energien in keV)

Probe	Peak/Kante	E / keV	NaI Szinti	PCV Szinti
^{137}Cs	Photo	662	sichtbar	
	Compton	477	sichtbar	sichtbar
	Rückstreu	183	sichtbar	
^{22}Na	Photo	511	sichtbar	
	Compton	341	sichtbar	sichtbar
	Photo	1277	sichtbar	
	Compton	1064	sichtbar	sichtbar

^{22}Na sample (measurement time 16.5h)

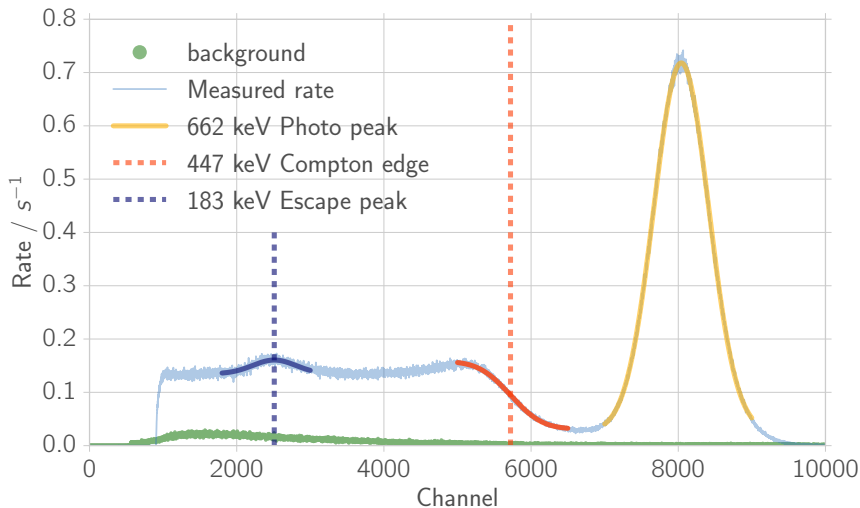
^{137}Cs sample (measurement time 6h)

Linear fit



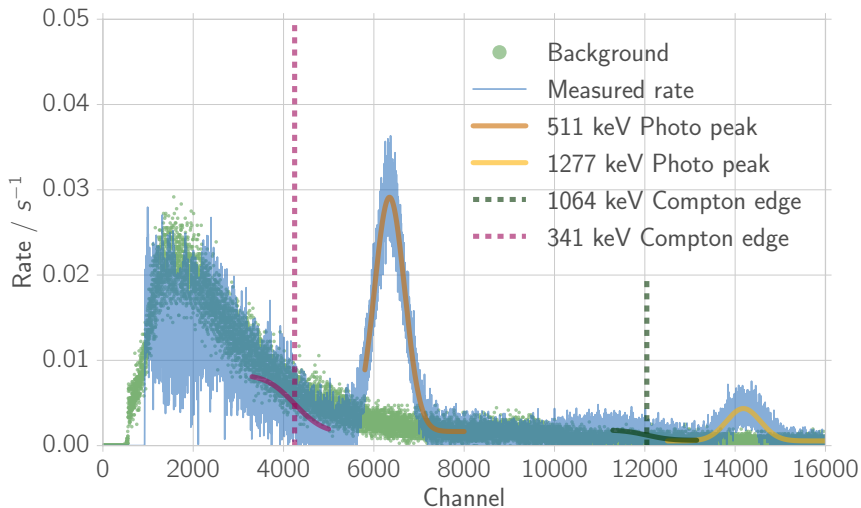
Peaks and fitting results of ^{137}Cs

Name	Energy	Channel
Photo peak	662 keV	8040.59 ± 0.03
Compton edge	477 keV	5720 ± 4
Escape peak	183 keV	2510 ± 12

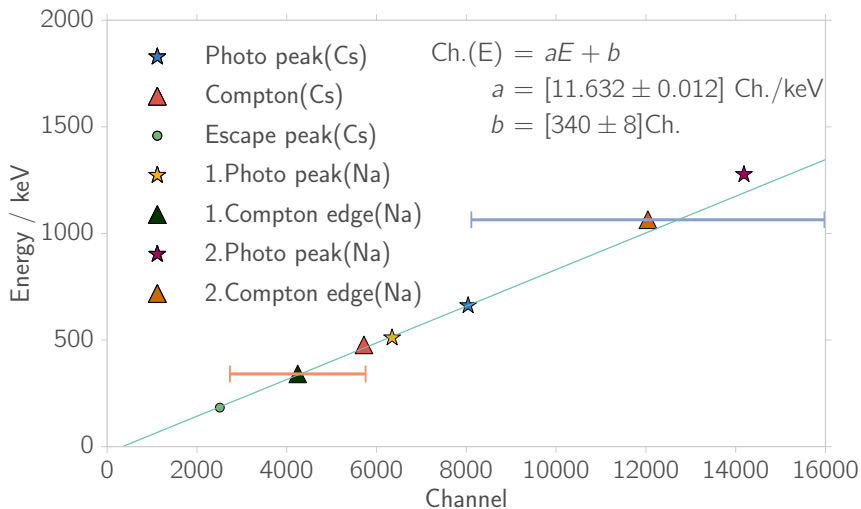
^{137}Cs sample (measurement time 2.7h)

Peaks and fitting results of ^{22}Na

Name	Energy	Channel
1. Photo peak	511 keV	6347 ± 3
2. Photo peak	1277 keV	14180 ± 20
1. Compton edge	341 keV	4000 ± 2000
2. Compton edge	1064 keV	12000 ± 4000

^{22}Na sample (measurement time about 1h)

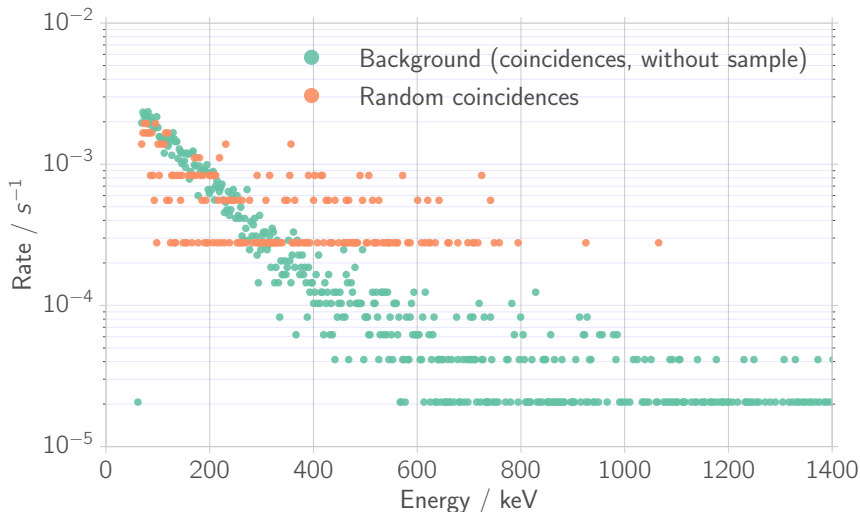
Linear fit



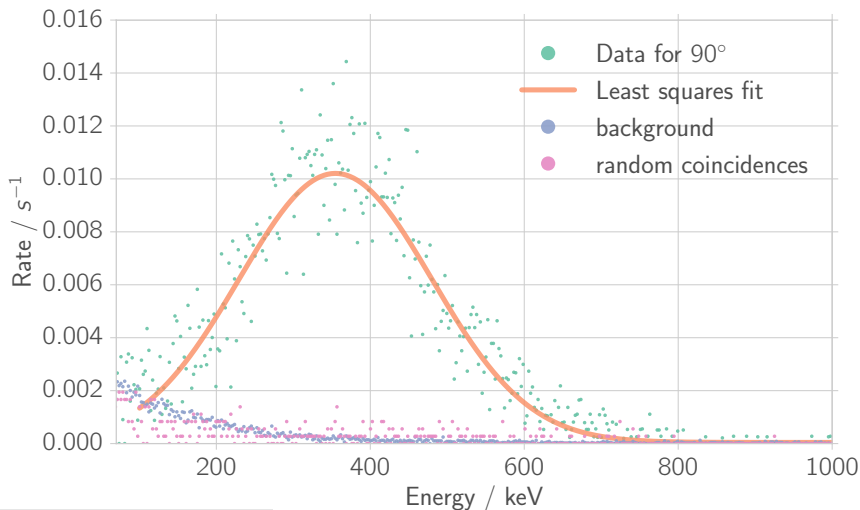
Energy Conservation

- Comparison of peak energies for different angles

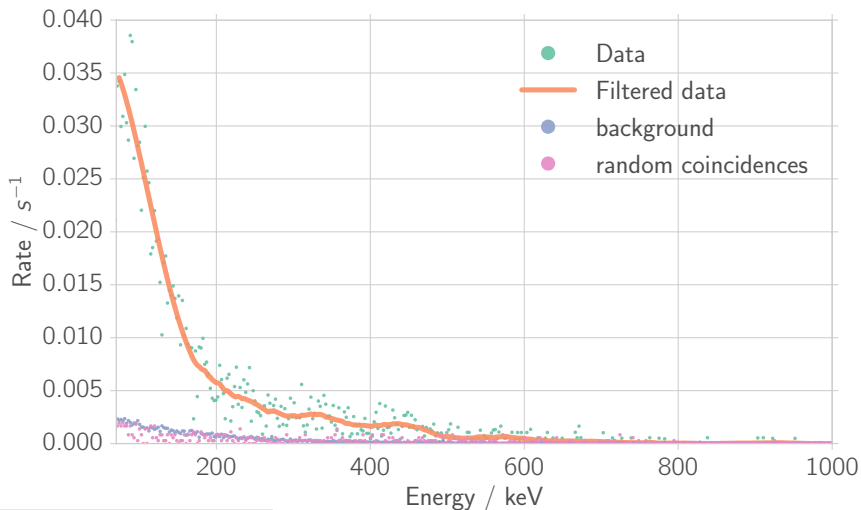
Background of the PS scintillator with coincidence and random coincidences (measur. time 13.4h and 1h)



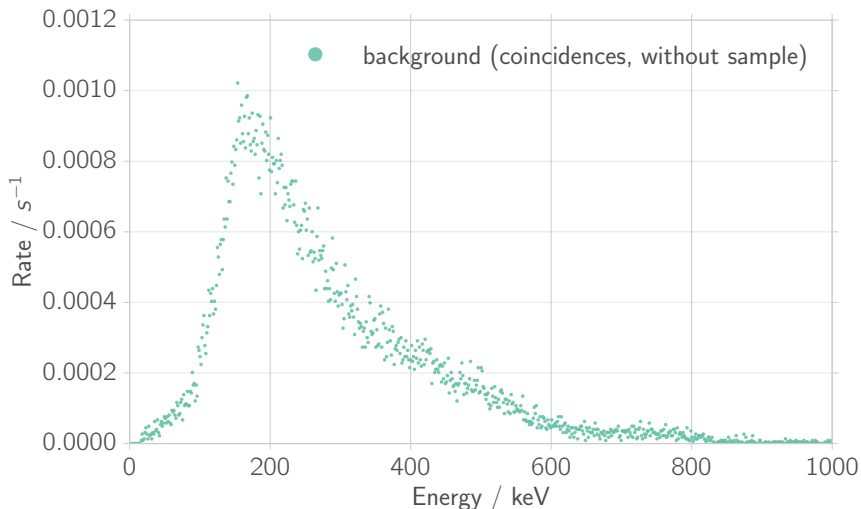
Energy of electrons: Rate of coincident events of PS scintillator at angle of $\theta = 90^\circ$



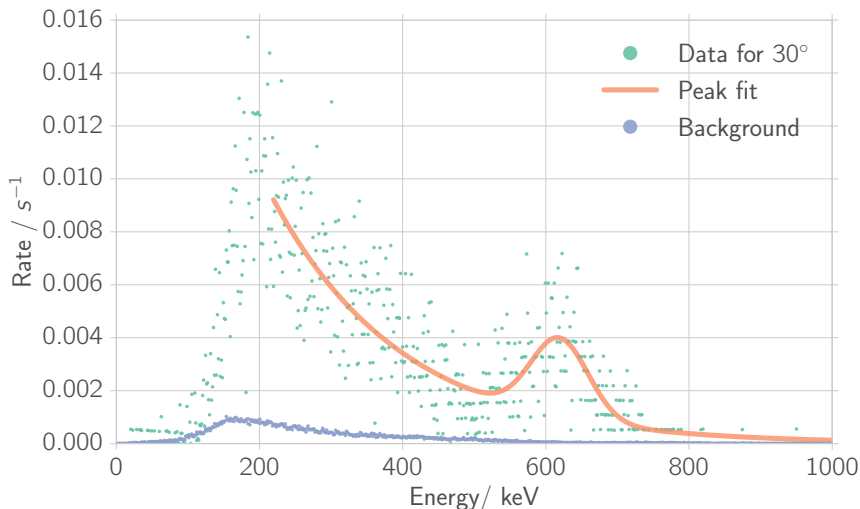
Energy of electrons: Rate of coincident events of PS scintillator at angle of $\theta = 15^\circ$



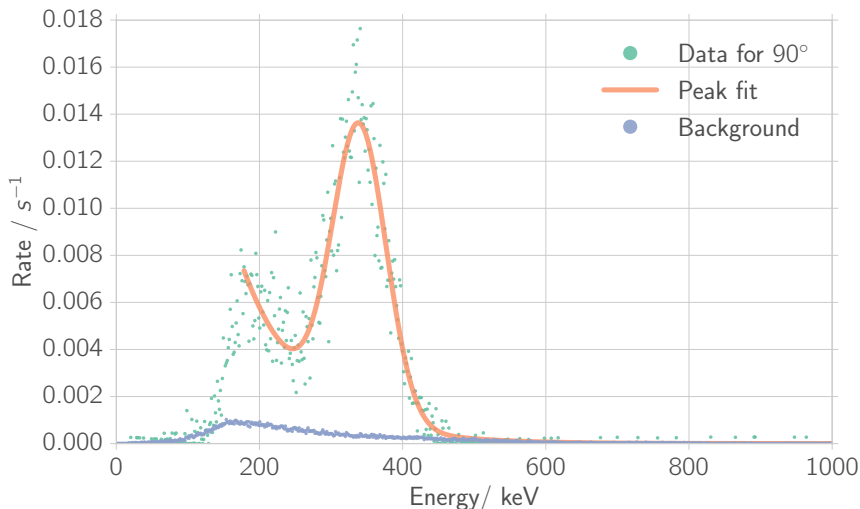
Background of NaI scintillator with coincidences (measur. time 62h)



Energy of photons: Rate of coincident events of NaI scintillator at angle $\theta = 30^\circ$



Energy of photons: Rate of coincident events of NaI scintillator at angle $\theta = 90^\circ$



Now to the result: combining all those peaks...