

# Compton scattering

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Theoretical background

Experimental setup

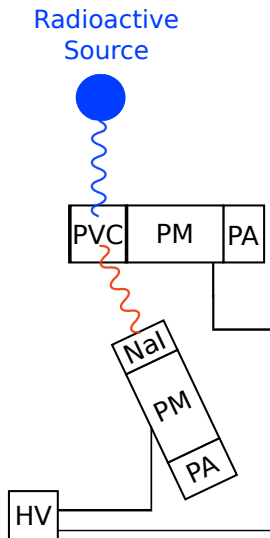
$^{137}\text{Cs}$  und  $^{22}\text{Na}$  samples

Szintillatoren

Calibration of PS scintillator

Calibration of Na scintillator

Energy Conservation





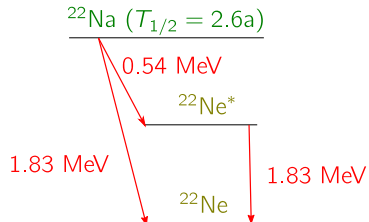
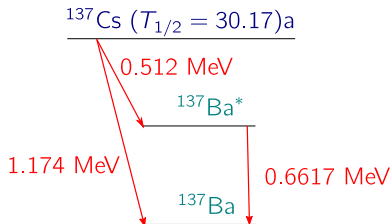
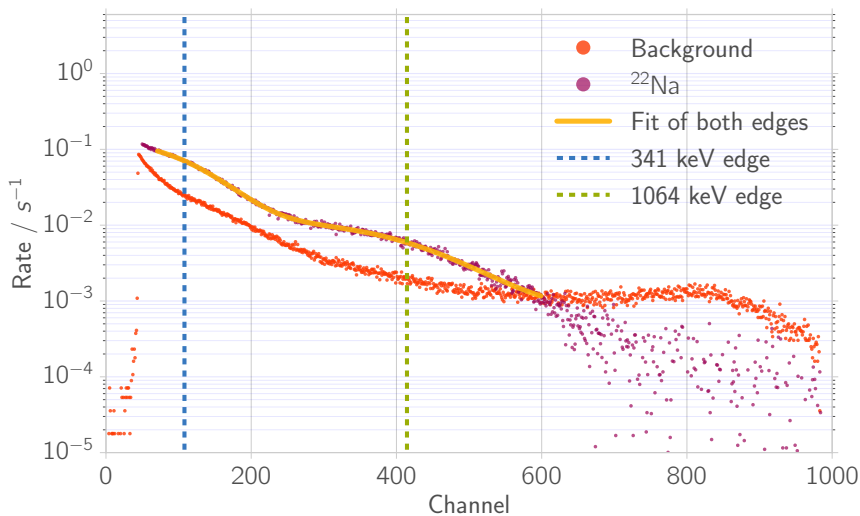
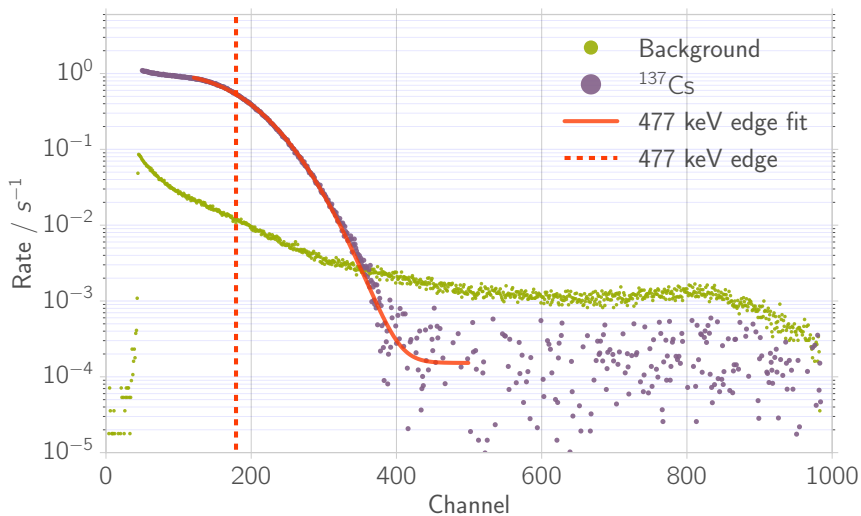


Table: Sichtbare Peaks und Kanten (Energien in keV)

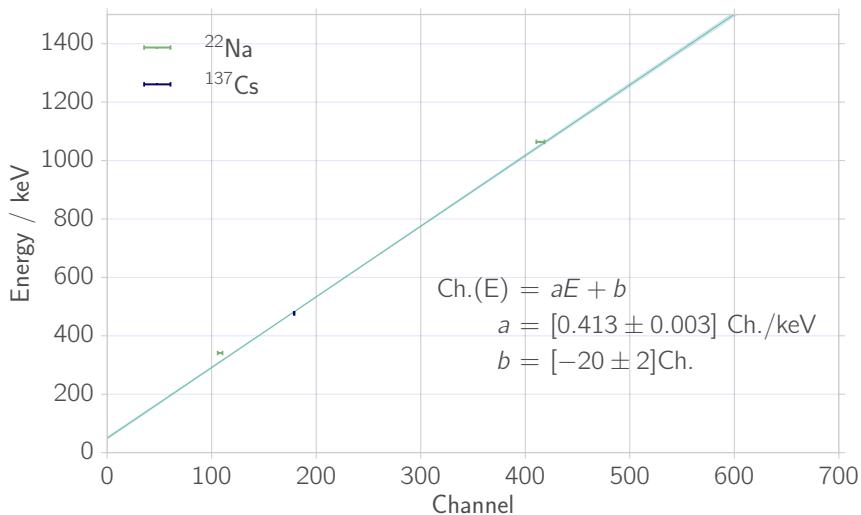
Probe	Peak/Kante	$E$ / keV	NaI Szinti	PCV Szinti
$^{137}\text{Cs}$	Photo	662	sichtbar	
	Compton	477	sichtbar	sichtbar
	Rückstreu	183	sichtbar	
$^{22}\text{Na}$	Photo	511	sichtbar	
	Compton	341	sichtbar	sichtbar
	Photo	1277	sichtbar	
	Compton	1064	sichtbar	sichtbar

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

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

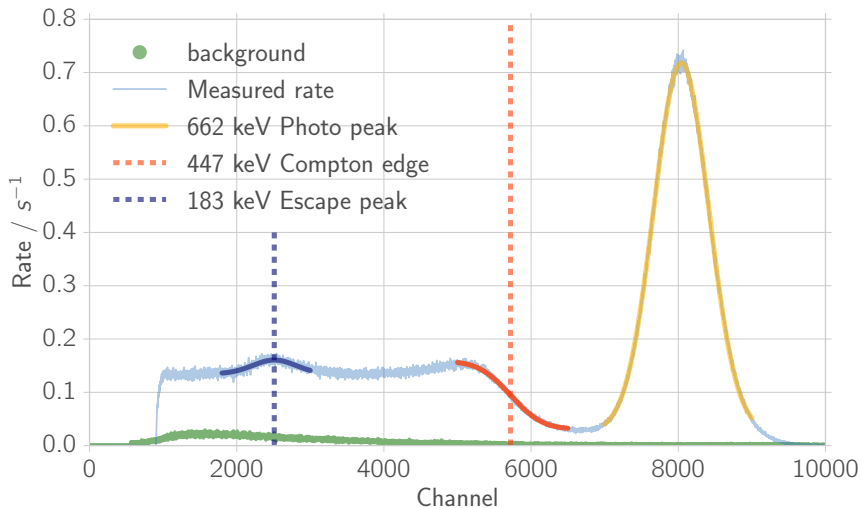


# Linear fit



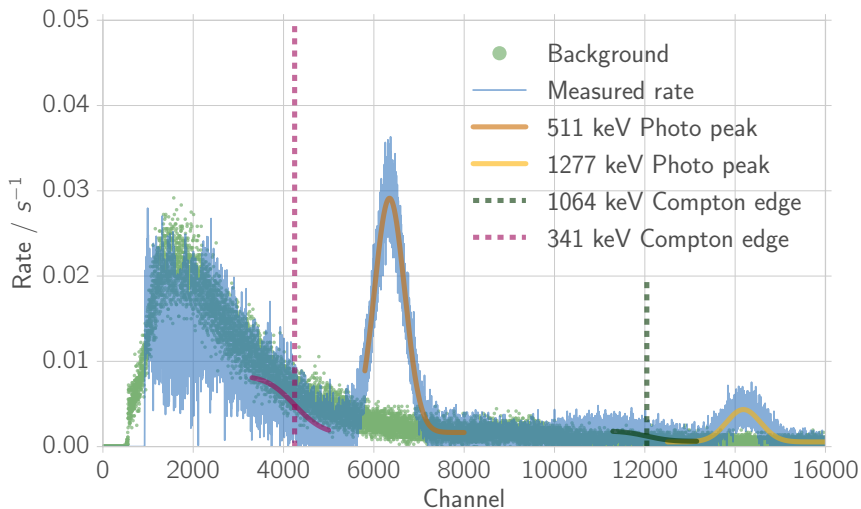
Peaks and fitting results of  $^{137}\text{Cs}$ 

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

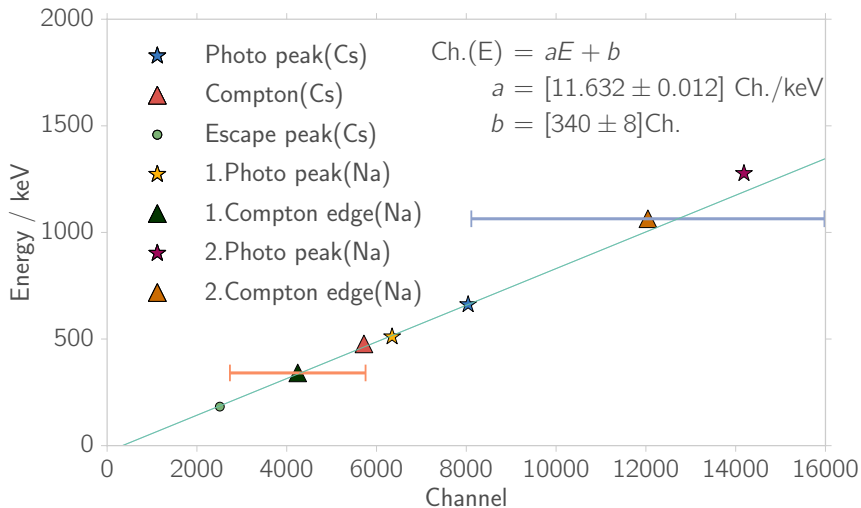
$^{137}\text{Cs}$  sample (measurement time 2.7h)

# Peaks and fitting results of $^{22}\text{Na}$

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

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

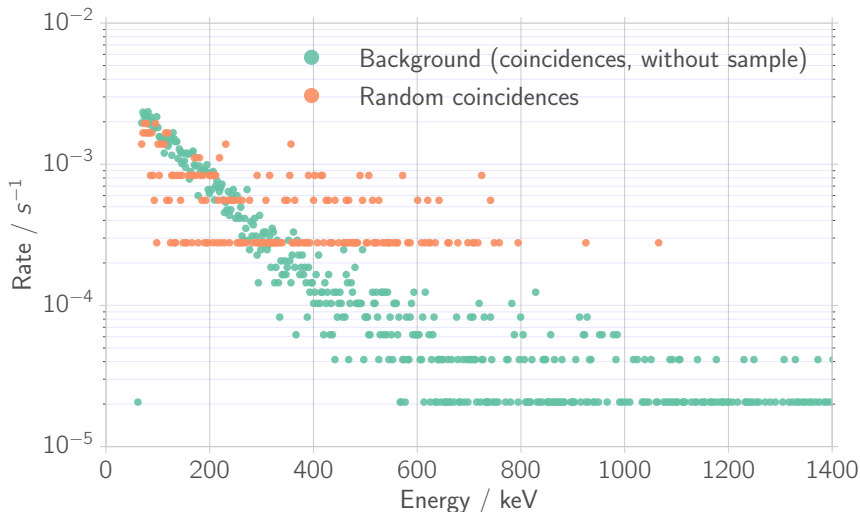
## Linear fit



# Energy Conservation

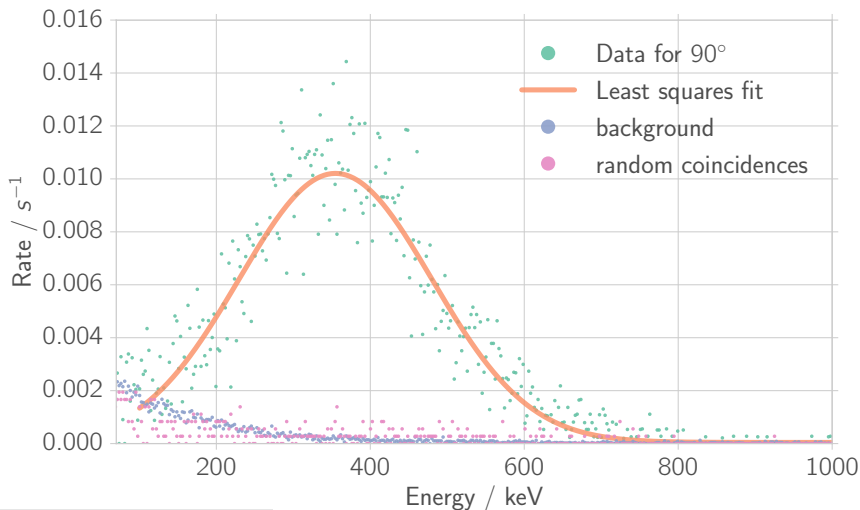
- Comparison of peak energies for different angles

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

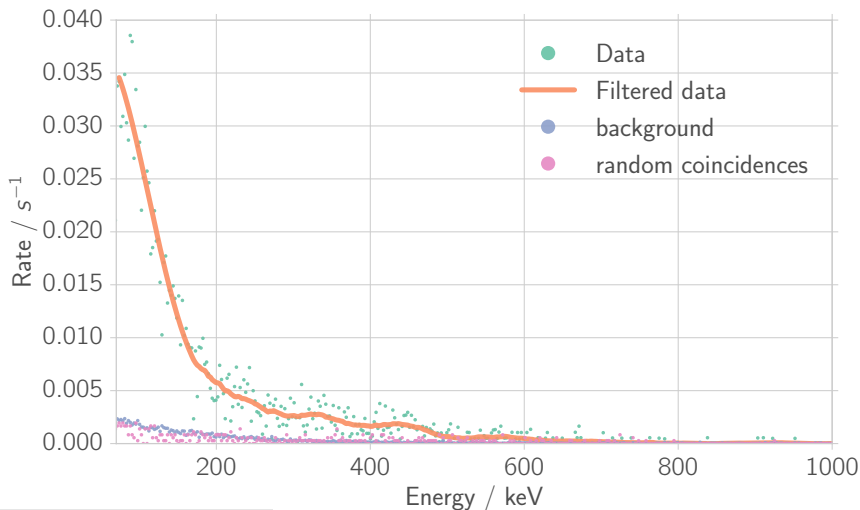




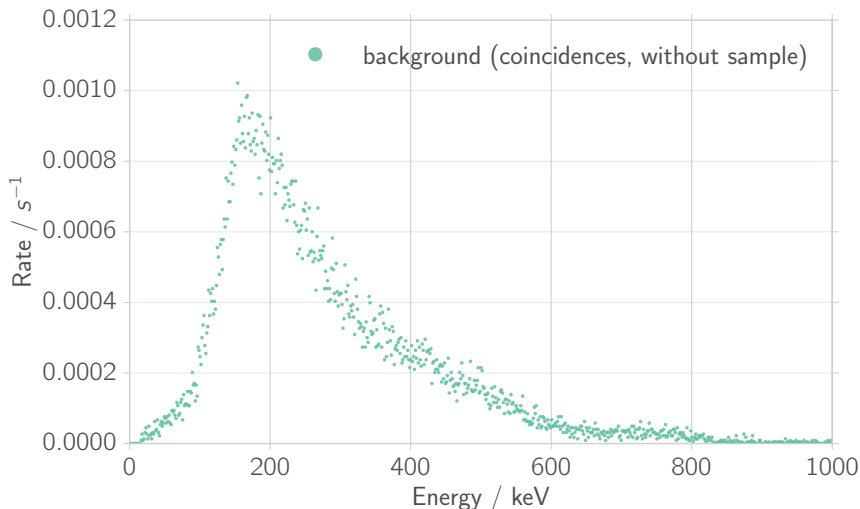
# Energy of electrons: Rate of coincident events of PS scintillator at angle of $\theta = 90^\circ$



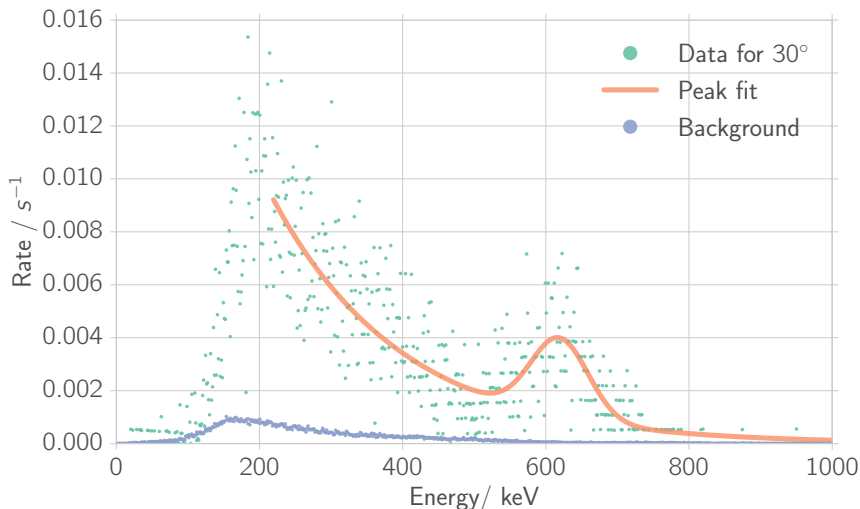
Energy of electrons: Rate of coincident events of PS scintillator at angle of  $\theta = 15^\circ$



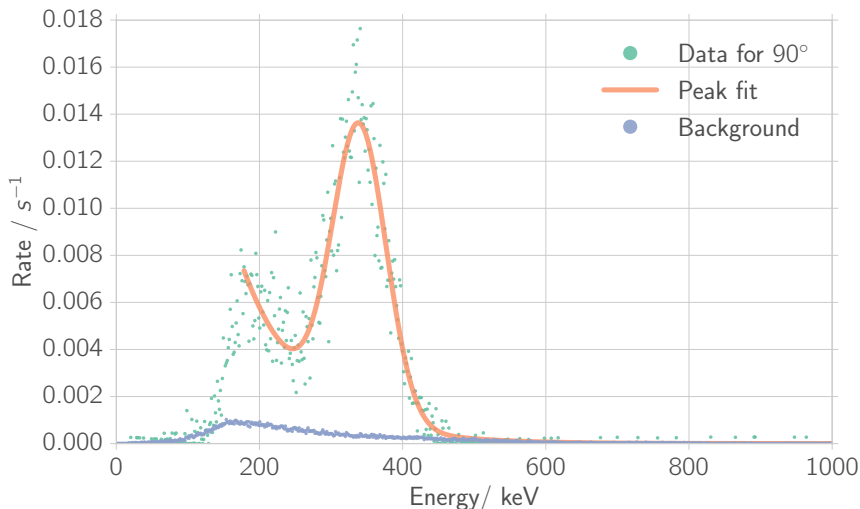
# Background of NaI scintillator with coincidences (measur. time 62h)



# 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...