

# Compton Streuung

## Elektronen außer Rand und Band

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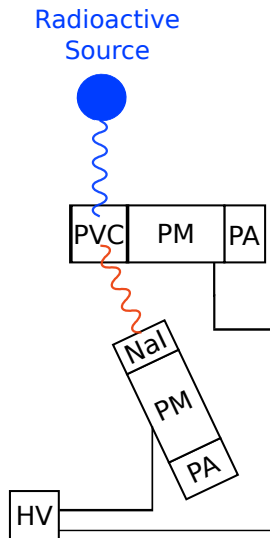
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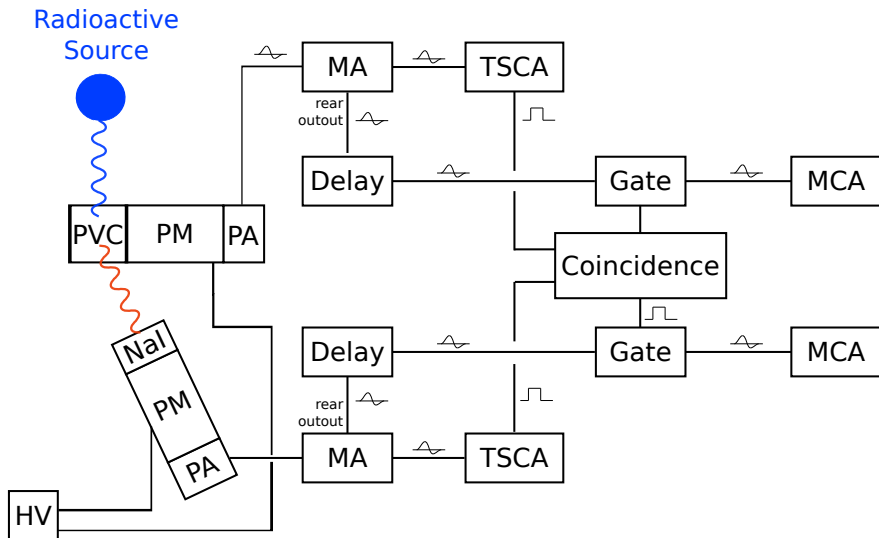
# Foto des Aufbaus

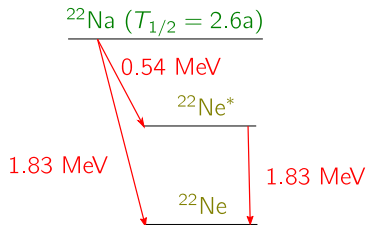
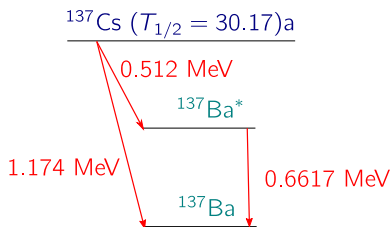


# Aufbau ohne Elektronik

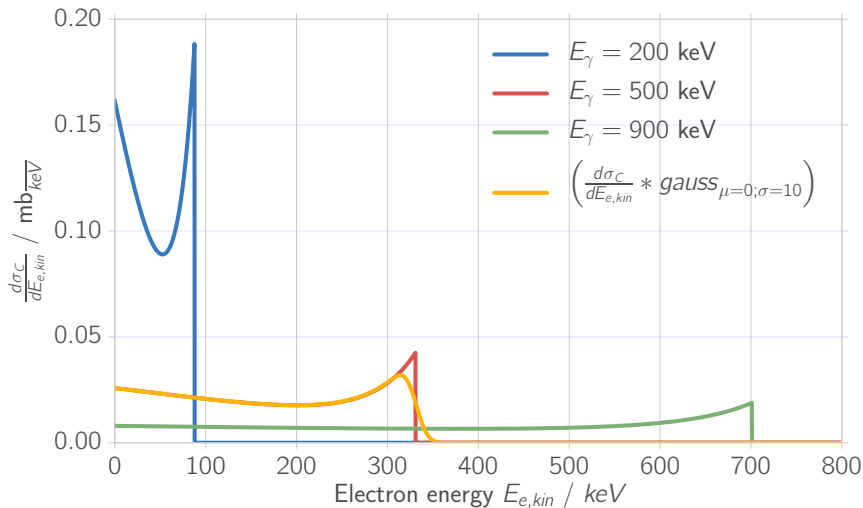


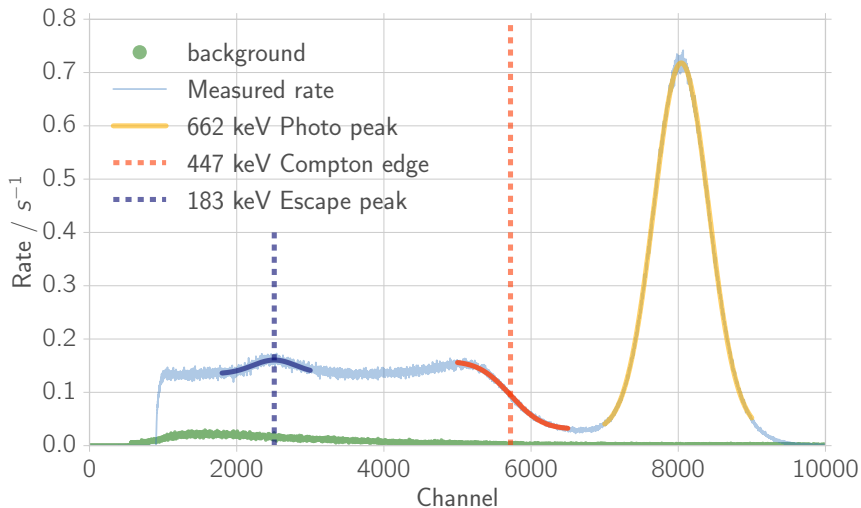
# Aufbau mit Elektronik



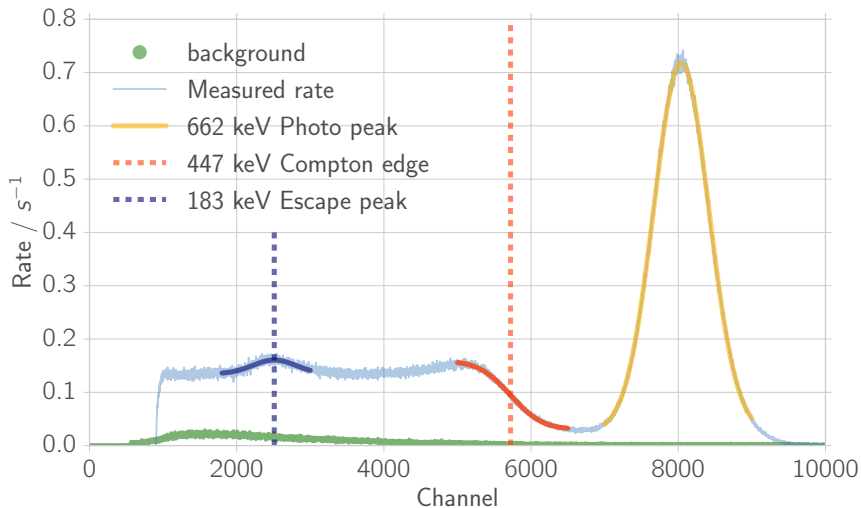
Zerfallsschemata von  $^{137}\text{Cs}$  und  $^{22}\text{Na}$ 

# Wie sieht ein Compton Peak aus? Klein-Nishina Formel!



NaI Szintillator,  $^{137}\text{Cs}$  Probe, mit PVC

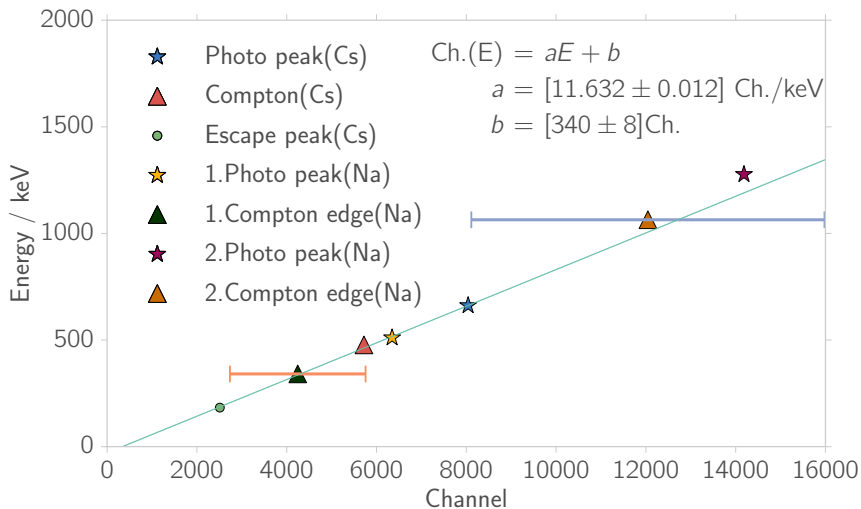


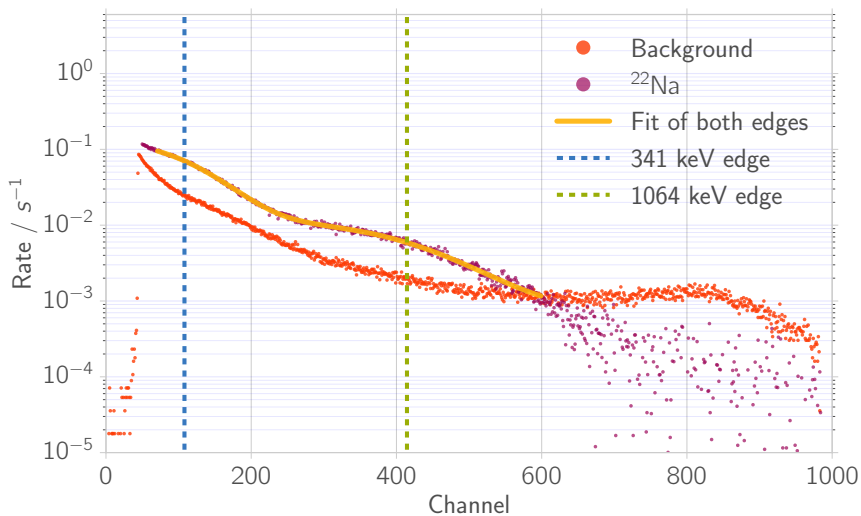
NaI Szintillator,  $^{137}\text{Cs}$  Probe, mit PVC

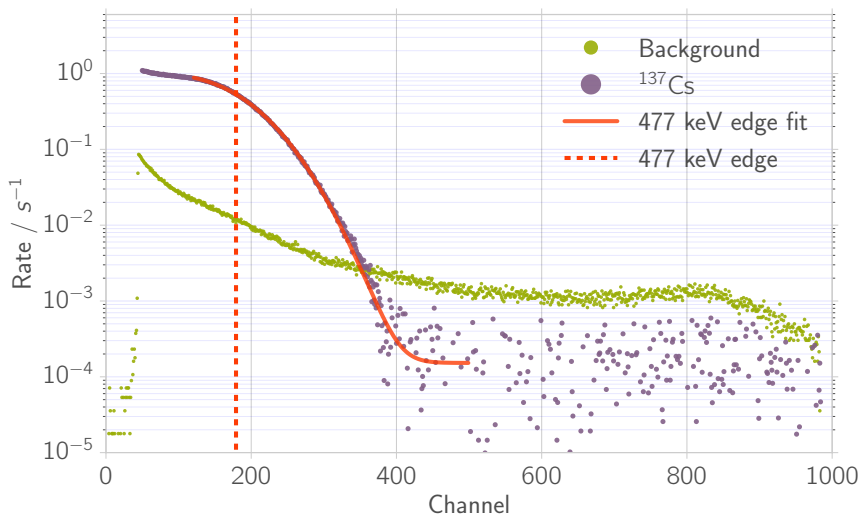
## Sichtbare Peaks und Kanten für beide Szintillatoren

Probe	Peak/Kante	$E$ / keV	NaI / Channel	PVC / Channel
$^{137}\text{Cs}$	Photo	662	$8040.59 \pm 0.03$	
	Compton	477	$5720 \pm 4$	$178.9 \pm 0.3$
	Rückstreu	183	$2510 \pm 12$	
$^{22}\text{Na}$	Photo	511	$6347 \pm 3$	
	Compton	341	$4000 \pm 2000$	$108 \pm 2$
	Photo	1277	$14180 \pm 20$	
	Compton	1064	$12000 \pm 4000$	$414 \pm 4$

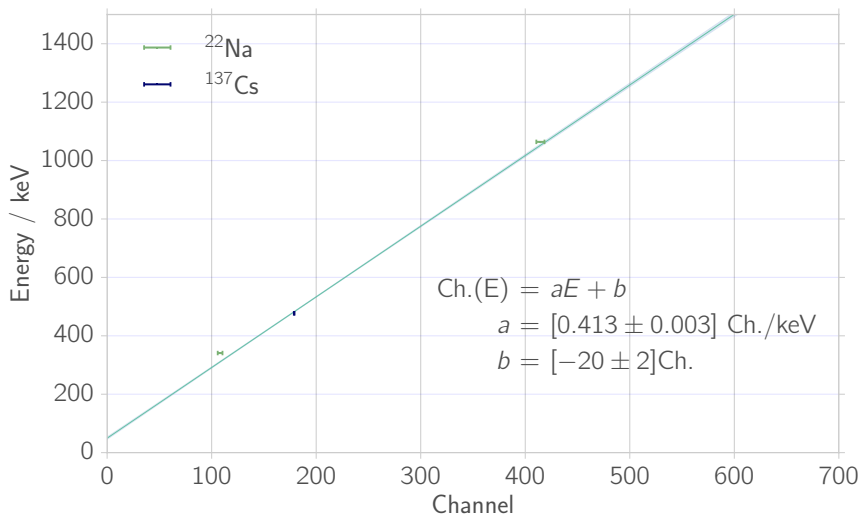
# Linearer fit für NaI Szintillator



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

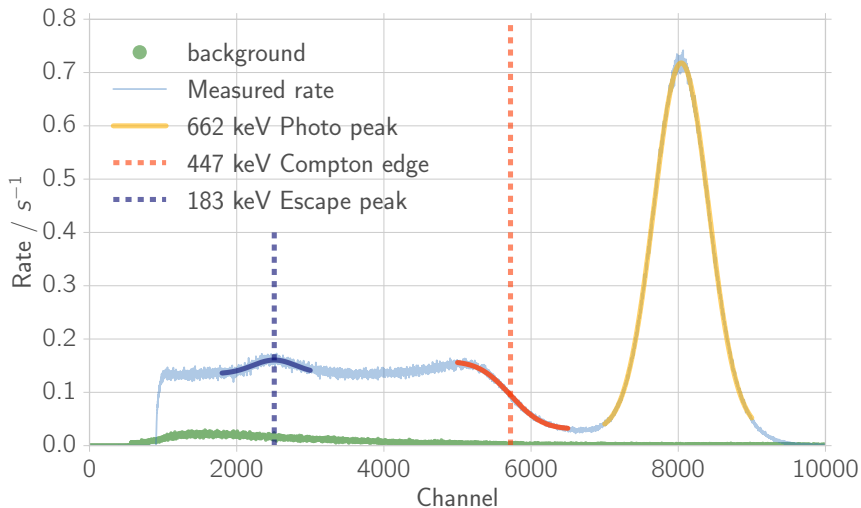
$^{137}\text{Cs}$  sample (measurement time 6h)

# Linear fit

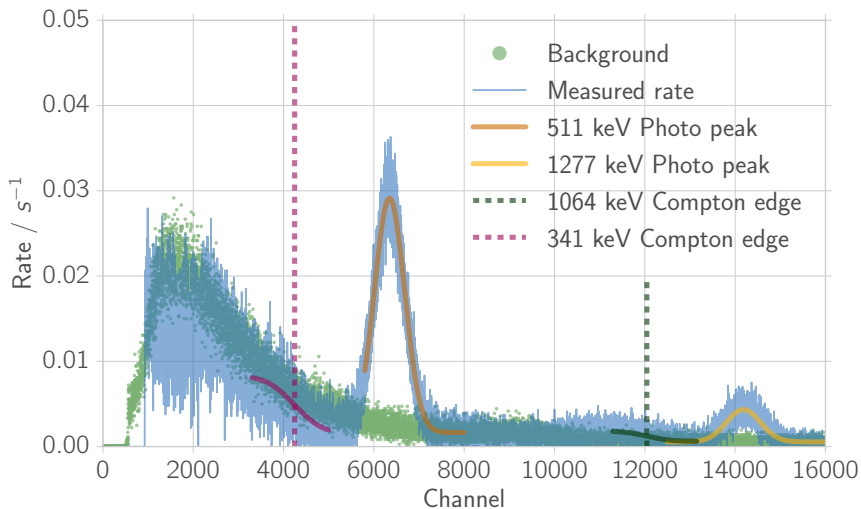


Peaks and fitting results of  $^{137}\text{Cs}$ 

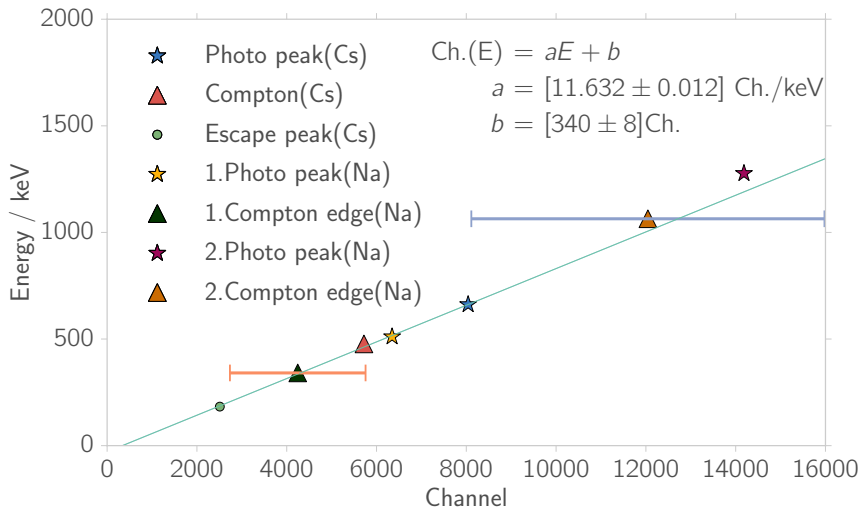
Name	Energy	Channel
Photo peak	662 keV	$8040.59 \pm 0.03$
Compton edge	477 keV	$5720 \pm 4$
Escape peak	183 keV	$2510 \pm 12$

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

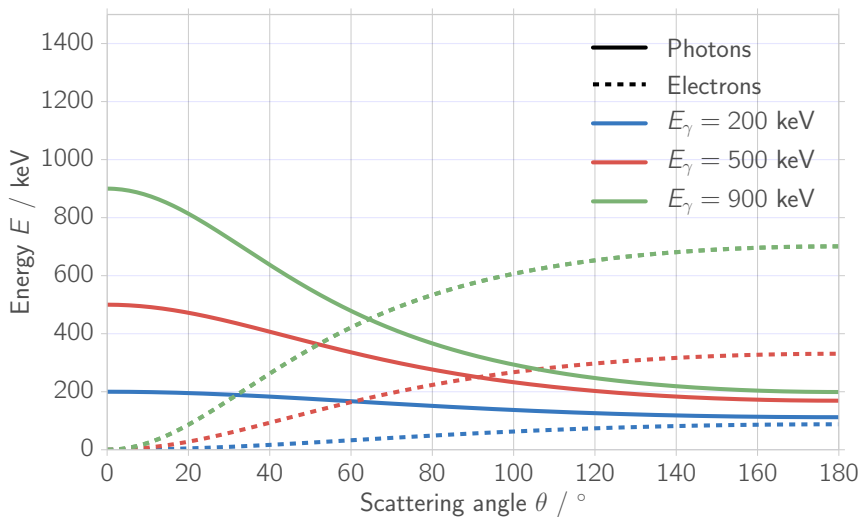


$^{22}\text{Na}$  sample (measurement time about 1h)

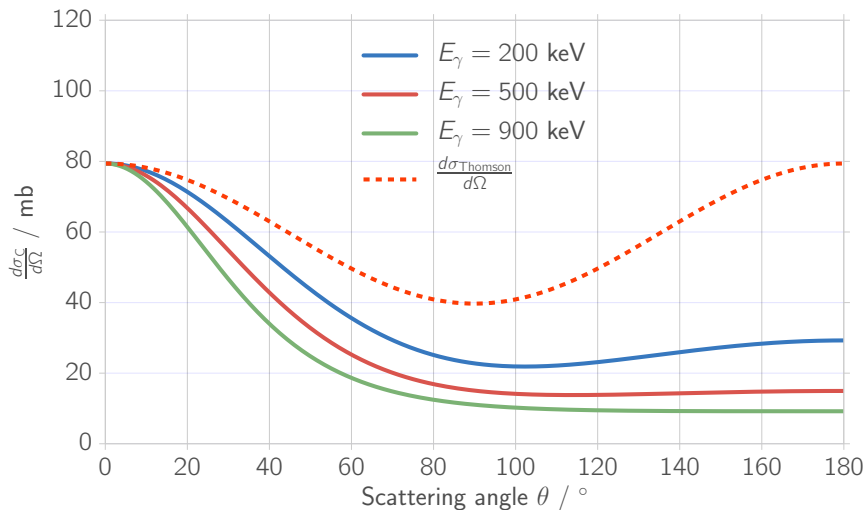
## Linear fit



# Energieerhaltung



# Differentieller Wirkungsquerschnitt



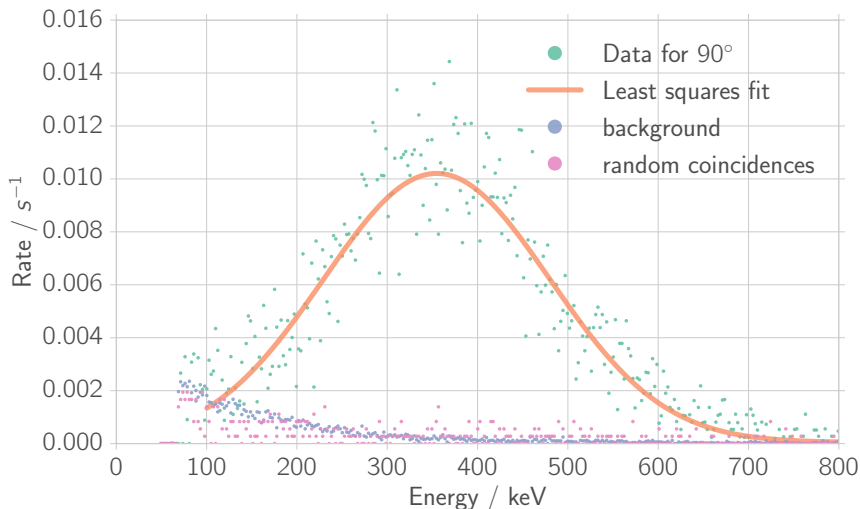
# Energy Conservation

- ▶ Comparison of peak energies for different angles

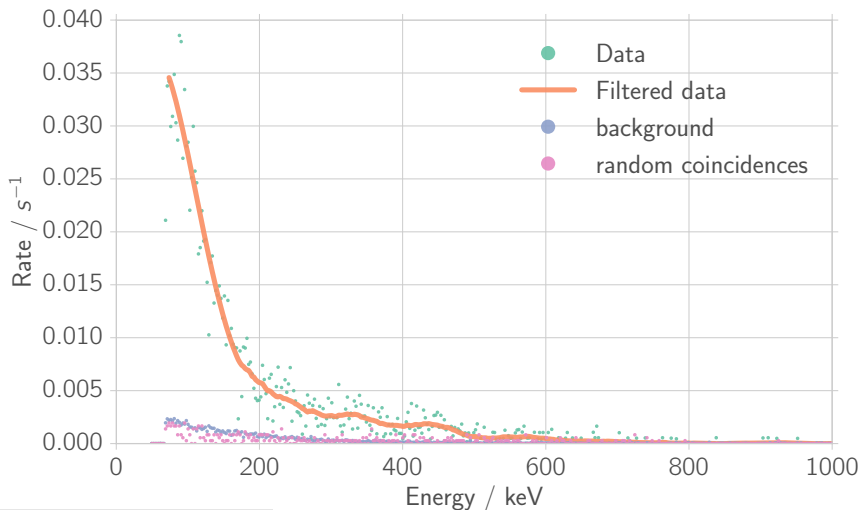
Background of the PS scintillator with coincidence and random coincidences (measur. time 13.4h and 1h)



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

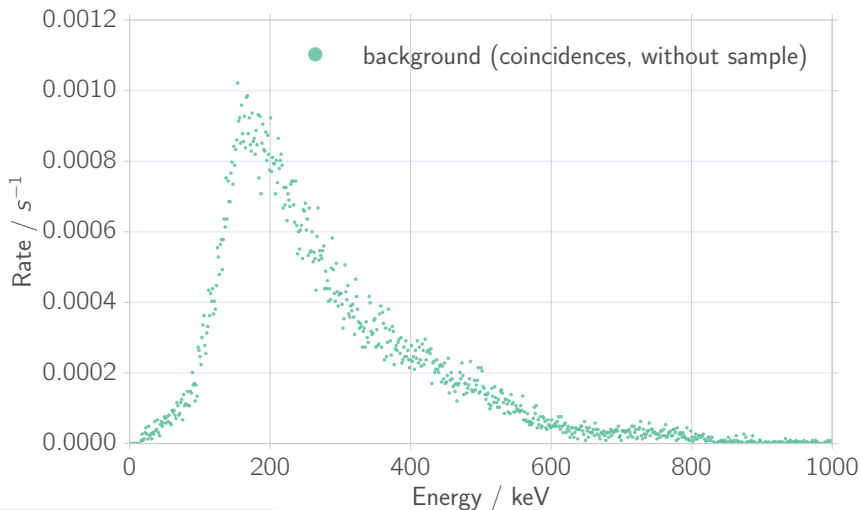


# Energy of electrons: Rate of coincident events of PS scintillator at angle of $\theta = 15^\circ$

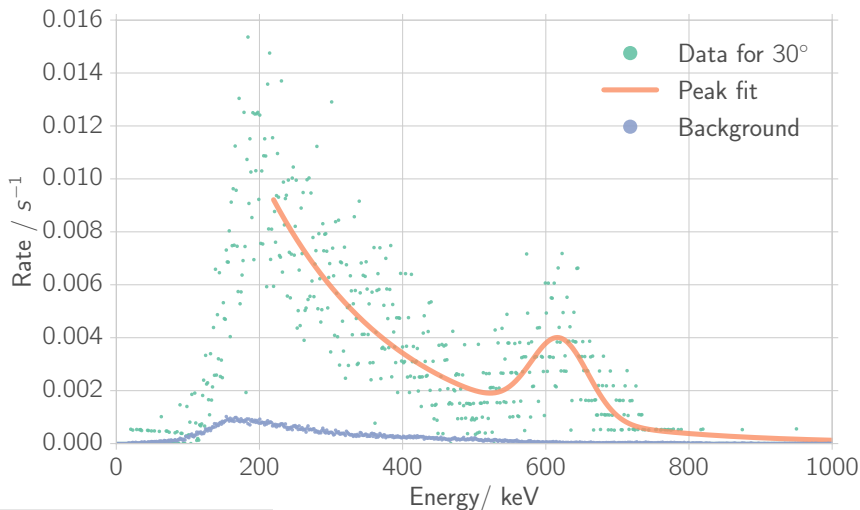




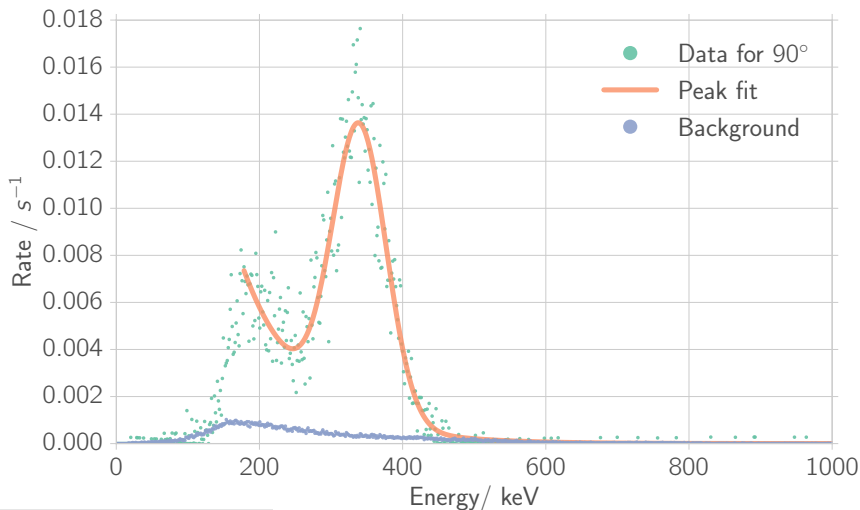
# Background of NaI scintillator with coincidences (measur. time 62h)



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...

# Nal szintillátor, $^{137}\text{Cs}$ Probe, ohne PVC

