In[14]:=
```
Kanal = {2493.68, 1876.64, 4993.99, 4582.1, 5230};
keV = {662, 511, 1275, 1172, 1332};
sigma = {2.86423, 5.14387, 6.11285, 5.7268, 2.82568};
europkanal = {286.82, 788.405, 1195.37,
   2973.69, 3730.48, 4334.16, 5540.65, 4227.72, 1468.73, 1603.07};
europlit = {121.78, 244.70, 344.30, 778.90, 964.08,
   1121.0, 1408, 1085.9, 411.12, 443.96};
europsigma = {3.86725, 2.78275, 2.44345, 3.32906, 3.65641,
   5.01699, 5.73988, 4.07549, 3.46559, 3.2386};
uhrkanal = {578.963, 776.907, 994.508, 1226.44, 2279.69, 4365.45};
gluhkanal = {761.969, 993.524, 1169.44, 1225.28,
   1876.5, 2171.49, 2278.86, 3512.80, 5750.55, 6286.62, 6981.71};
leerkanal = {762.27, 993.202, 1169.55, 1225.67, 1875.69, 2171.75,
   2278.83, 3512.2, 3747.11, 5749.93, 6284.24, 6980.42};

data1 = Transpose[{Kanal, keV}];
data3 = Transpose[{europkanal, europlit}];
data2 = Transpose[{keV, sigma / keV}];
data4 = Transpose[{europkanal, europsigma / europkanal}];
```

In[27]:=

In[28]:=
```
data = LinearModelFit[data1, x, x]
data["ParameterTable"]
datae = LinearModelFit[data3, x, x]
datae["ParameterTable"]
dataa = LinearModelFit[Join[data3, data1], x, x]
dataa["ParameterTable"]
```

Out[28]= FittedModel[51.4227 + 0.244826 x]

Out[29]=

	Estimate	Standard Error	t-Statistic	P-Value
1	51.4227	1.18858	43.2641	0.0000271802
x	0.244826	0.000291674	839.382	3.72898×10^{-9}

Out[30]= FittedModel[51.1131 + 0.245233 x]

Out[31]=

	Estimate	Standard Error	t-Statistic	P-Value
1	51.1131	1.62692	31.4171	1.14622×10^{-9}
x	0.245233	0.000522436	469.402	4.75114×10^{-19}

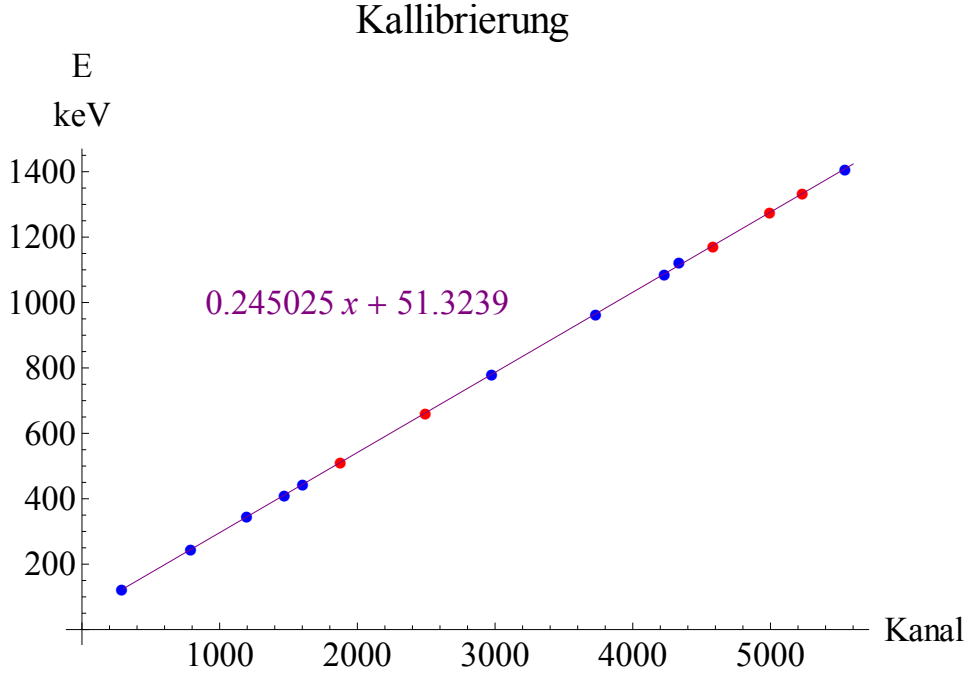
Out[32]= FittedModel[51.3239 + 0.245025 x]

Out[33]=

	Estimate	Standard Error	t-Statistic	P-Value
1	51.3239	1.22327	41.9562	2.89411×10^{-15}
x	0.245025	0.000353123	693.879	4.37014×10^{-31}

In[34]:=
```
Show[ListPlot[data1, PlotStyle -> Red, PlotMarkers → Automatic,
  PlotRange → All, AxesOrigin → {0, 0}, AxesLabel → {"Kanal", "E\nkeV"}],
 ListPlot[data3, PlotStyle -> Blue, PlotMarkers → Automatic, PlotRange → All],
 Plot[dataa[x], {x, 300, 5600}, PlotStyle → {Purple}], ImageSize → 500, BaseStyle → 18,
 Epilog → {Purple, Inset[dataa[x], {2000, 1000}]}, PlotLabel → "Kallibrierung"]
```

Out[34]=



In[35]:=
```
nlmf = NonlinearModelFit[data2, b + a/Sqrt[n], {a, b}, n]
nlmf["ParameterTable"]
nlmfe = NonlinearModelFit[data4, a/Sqrt[n] + b, {a, b}, n]
nlmfe["ParameterTable"]
nlmfa = NonlinearModelFit[Join[data2, data4], b + a/Sqrt[n], {a, b}, n]
nlmfa["ParameterTable"]
```

Out[35]= $\text{FittedModel}\left[-0.00496226 + \frac{0.304117}{\sqrt{n}}\right]$

Out[36]=

	Estimate	Standard Error	t-Statistic	P-Value
a	0.304117	0.136852	2.22224	0.112807
b	−0.00496226	0.00468337	−1.05955	0.367105

Out[37]= $\text{FittedModel}\left[-0.00370984 + \frac{0.259671}{\sqrt{n}}\right]$

Out[38]=

	Estimate	Standard Error	t-Statistic	P-Value
a	0.259671	0.0326504	7.95305	0.0000455571
b	−0.00370984	0.000932009	−3.98048	0.00405899

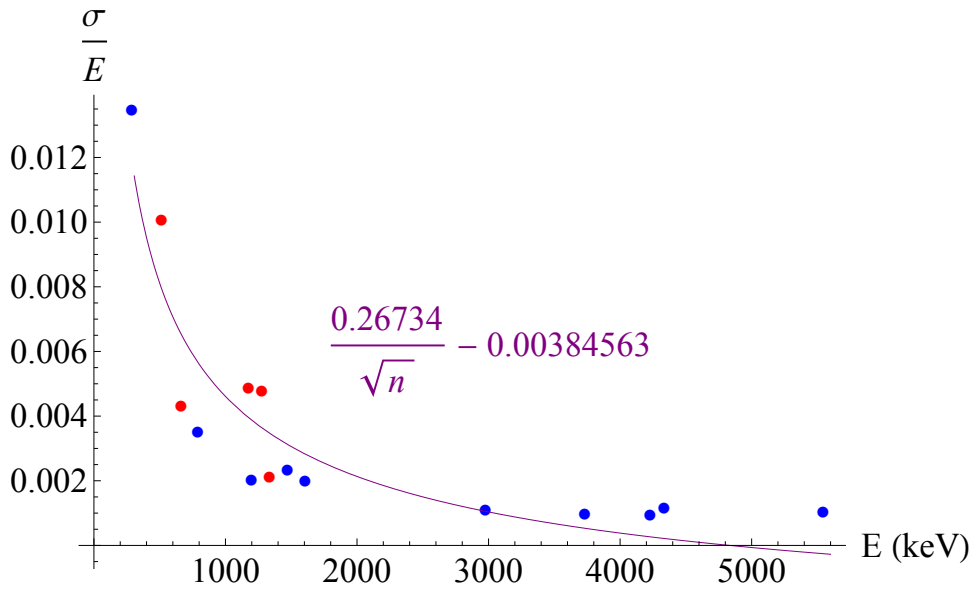
Out[39]= $\text{FittedModel}\left[-0.00384563 + \frac{0.26734}{\sqrt{n}}\right]$

Out[40]=

	Estimate	Standard Error	t-Statistic	P-Value
a	0.26734	0.0315078	8.48486	1.16739×10^{-6}
b	−0.00384563	0.000962718	−3.99455	0.00152768

In[41]:=
```
Show[ListPlot[data2, PlotStyle -> Red, PlotMarkers → Automatic,
  PlotRange → All, AxesOrigin → {0, 0}, AxesLabel → {"E (keV)", "σ/E"}],
 ListPlot[data4, PlotStyle -> Blue, PlotMarkers → Automatic, PlotRange → All],
 Plot[nlmfa[x], {x, 0, 5600}, PlotStyle → Purple], ImageSize → 500,
 BaseStyle → 18, Epilog → {Purple, Inset[nlmfa[n], {3000, 0.006}]}]
```

Out[41]=



In[42]:=
```
europener = data[x] /. x → europkanal;
{Join[{"Kanal"}, europkanal], Join[{"Energie (keV)"}, europener]} // Transpose //
 TableForm
```

Out[42]//TableForm=

Kanal	Energie (keV)
286.82	121.644
788.405	244.445
1195.37	344.081
2973.69	779.46
3730.48	964.742
4334.16	1112.54
5540.65	1407.92
4227.72	1086.48
1468.73	411.006
1603.07	443.896

In[43]:=
```
uhrener = data[x] /. x → uhrkanal;
{Join[{"Kanal"}, uhrkanal], Join[{"Energie (keV)"}, uhrener],
   {"Isotop (keV)", " 226Ra(186.21)", " 241Pb(241.98)", " 214Pb(295.210)",
    " 214Pb(351.92)", " 214Bi(609.31)", " 214Bi(1120.3)"}} // Transpose // TableForm
```

Out[44]//TableForm=

Kanal	Energie (keV)	Isotop (keV)
578.963	193.168	^{226}Ra(186.21)
776.907	241.63	^{241}Pb(241.98)
994.508	294.904	^{214}Pb(295.210)
1226.44	351.687	^{214}Pb(351.92)
2279.69	609.55	^{214}Bi(609.31)
4365.45	1120.2	^{214}Bi(1120.3)

In[45]:=
```
gluhener = data[x] /. x → gluhkanal;
{Join[{"Kanal"}, gluhkanal], Join[{"Energie (keV)"}, gluhener],
   {"Isotop (keV)", " 212Pb(238.630)", " 214Pb(295.210)", " 228Ac(338.320)",
    " 214Pb(351.920)", " 208Tl(510.840)", " 208Tl(583.140)", " 214Bi(609.310)",
    " 228Ac(911.070)", " 40K(1460.800)", "-", "-"}} // Transpose // TableForm
```

Out[46]//TableForm=

Kanal	Energie (keV)	Isotop (keV)
761.969	237.973	^{212}Pb(238.630)
993.524	294.663	^{214}Pb(295.210)
1169.44	337.732	^{228}Ac(338.320)
1225.28	351.403	^{214}Pb(351.920)
1876.5	510.839	^{208}Tl(510.840)
2171.49	583.06	^{208}Tl(583.140)
2278.86	609.347	^{214}Bi(609.310)
3512.8	911.448	^{228}Ac(911.070)
5750.55	1459.31	^{40}K(1460.800)
6286.62	1590.55	-
6981.71	1760.73	-

In[59]:=
```
leerener = data[x] /. x → leerkanal;
{Join[{"Kanal"}, leerkanal], Join[{"Energie (keV)"}, leerener], {"Isotop (keV)",
    " 212Pb(238.630)", " 214Pb(295.210)", " 228Ac(338.320)", " 214Pb(351.920)",
    " 208Tl(510.840)", " 208Tl(583.140)", " 214Bi(609.310)", " 228Ac(911.070)",
    " 228Ac(969.11)", " 40K(1460.800)", "-", "-"}} // Transpose // TableForm
```

Out[60]//TableForm=

Kanal	Energie (keV)	Isotop (keV)
762.27	238.046	^{212}Pb(238.630)
993.202	294.585	^{214}Pb(295.210)
1169.55	337.759	^{228}Ac(338.320)
1225.67	351.499	^{214}Pb(351.920)
1875.69	510.641	^{208}Tl(510.840)
2171.75	583.124	^{208}Tl(583.140)
2278.83	609.34	^{214}Bi(609.310)
3512.2	911.301	^{228}Ac(911.070)
3747.11	968.813	^{228}Ac(969.11)
5749.93	1459.16	^{40}K(1460.800)
6284.24	1589.97	-
6980.42	1760.41	-