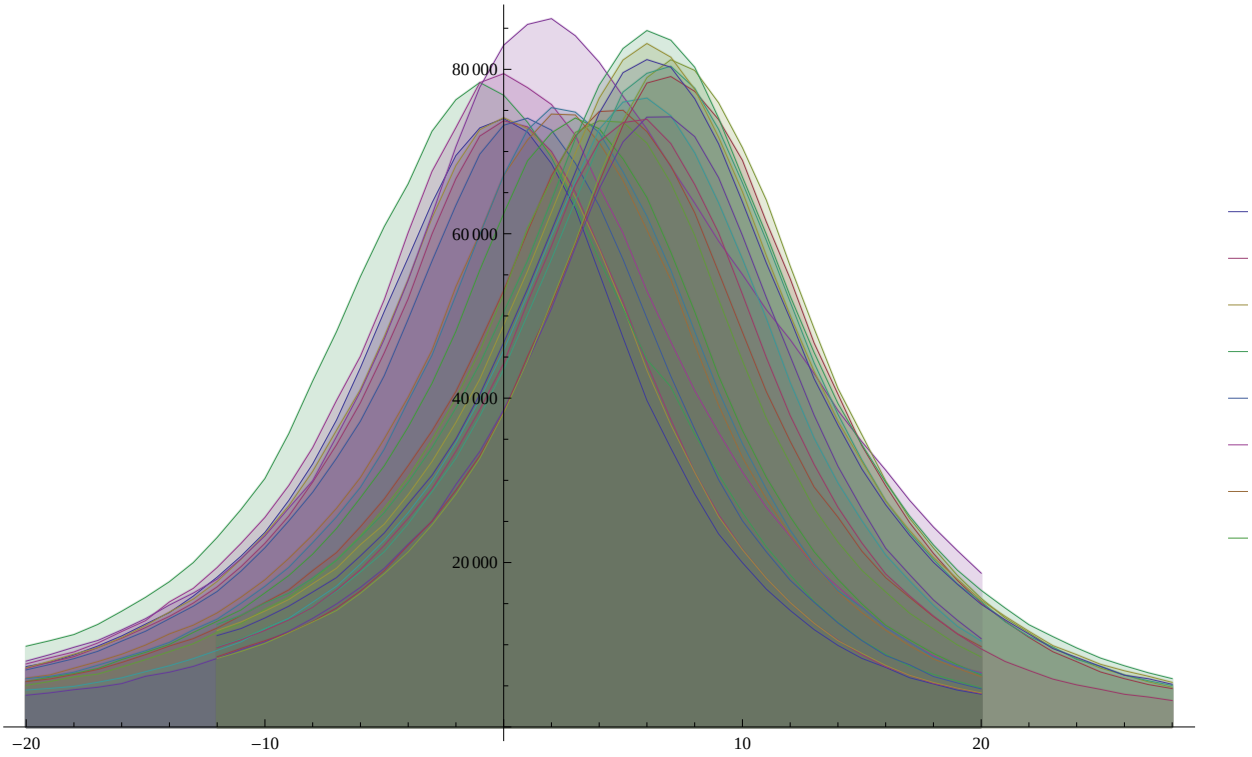
```
SetDirectory[
  "/Users/dns/OneDrive/Masters/SCI/PIEZO/Li2B4O7/23_06_Tetroboraat_Ev/untitled
    folder/"];

n21 = Import["ATKTETRO.0212.dat", {"Table"}];
n22 = Import["ATKTETRO.0222.dat", {"Table"}];
n23 = Import["ATKTETRO.0232.dat", {"Table"}];
n24 = Import["ATKTETRO.0242.dat", {"Table"}];
n25 = Import["ATKTETRO.0252.dat", {"Table"}];
n26 = Import["ATKTETRO.0262.dat", {"Table"}];
n27 = Import["ATKTETRO.0272.dat", {"Table"}];
n28 = Import["ATKTETRO.0282.dat", {"Table"}];
n29 = Import["ATKTETRO.0292.dat", {"Table"}];
n30 = Import["ATKTETRO.0302.dat", {"Table"}];
n31 = Import["ATKTETRO.0312.dat", {"Table"}];
n32 = Import["ATKTETRO.0322.dat", {"Table"}];
n33 = Import["ATKTETRO.0332.dat", {"Table"}];
n34 = Import["ATKTETRO.0342.dat", {"Table"}];
n35 = Import["ATKTETRO.0352.dat", {"Table"}];
n36 = Import["ATKTETRO.0362.dat", {"Table"}];
n37 = Import["ATKTETRO.0372.dat", {"Table"}];
n38 = Import["ATKTETRO.0382.dat", {"Table"}];
n39 = Import["ATKTETRO.0392.dat", {"Table"}];
n40 = Import["ATKTETRO.0402.dat", {"Table"}];
n41 = Import["ATKTETRO.0412.dat", {"Table"}];
```

```
ListLinePlot[{n21, n22,  n23, n24, n25, n26, n27, n28,
  n29, n30, n31, n32, n33, n34, n35, n36, n37, n38, n39, n40, n41},
 PlotLegends → {"21", "22", "23", "24", "25", "26", "27", "28", "29", "30", "31",
   "32", "33", "34", "35", "36", "37", "38", "39", "40", "41"}, Filling → Axis]
```




```
model = (A / Pi) * w / (4 * (x - x0) ^2 + w^2) +
    (B / 2 / ww) * Sqrt[4 * Log[N[E], 2] / Pi] * Exp[-4 * Log[N[E], 2] * (x - x0) ^2 / ww^2];
```

```
fit21 = FindFit[n21, model, {w, ww, B, x0, A}, x];
max21 = FindMaximum[model /. fit21, {x, 0}];
Q21 = x /. Flatten[max21][[2]];

fit22 = FindFit[n22, model, {w, ww, B, x0, A}, x];
max22 = FindMaximum[model /. fit22, {x, 1}];
Q22 = x /. Flatten[max22][[2]];

fit23 = FindFit[n23, model, {w, ww, B, x0, A}, x];
max23 = FindMaximum[model /. fit23, {x, 0}];
Q23 = x /. Flatten[max23][[2]];

fit24 = FindFit[n24, model, {w, ww, B, x0, A}, x];
max24 = FindMaximum[model /. fit24, {x, 0}];
Q24 = x /. Flatten[max24][[2]];

fit25 = FindFit[n25, model, {w, ww, B, x0, A}, x];
max25 = FindMaximum[model /. fit25, {x, 1}];
Q25 = x /. Flatten[max25][[2]];

fit26 = FindFit[n26, model, {w, ww, B, x0, A}, x];
max26 = FindMaximum[model /. fit26, {x, 0}];
Q26 = x /. Flatten[max26][[2]];
```

```
fit27 = FindFit[n27, model, {w, ww, B, x0, A}, x];
max27 = FindMaximum[model /. fit27, {x, 0}];
Q27 = x /. Flatten[max27][[2]];

fit28 = FindFit[n28, model, {w, ww, B, x0, A}, x];
max28 = FindMaximum[model /. fit28, {x, 1}];
Q28 = x /. Flatten[max28][[2]];


fit29 = FindFit[n29, model, {w, ww, B, x0, A}, x];
max29 = FindMaximum[model /. fit29, {x, 3}];
Q29 = x /. Flatten[max29][[2]];


fit30 = FindFit[n30, model, {w, ww, B, x0, A}, x];
max30 = FindMaximum[model /. fit30, {x, 0}];
Q30 = x /. Flatten[max30][[2]];

fit31 = FindFit[n31, model, {w, ww, B, x0, A}, x];
max31 = FindMaximum[model /. fit31, {x, 4}];
Q31 = x /. Flatten[max31][[2]];


fit32 = FindFit[n32, model, {w, ww, B, x0, A}, x];
max32 = FindMaximum[model /. fit32, {x, 2}];
Q32 = x /. Flatten[max32][[2]];

fit33 = FindFit[n33, model, {w, ww, B, x0, A}, x];
max33 = FindMaximum[model /. fit33, {x, 4}];
Q33 = x /. Flatten[max33][[2]];


fit34 = FindFit[n34, model, {w, ww, B, x0, A}, x];
max34 = FindMaximum[model /. fit34, {x, 1}];
Q34 = x /. Flatten[max34][[2]];

fit35 = FindFit[n35, model, {w, ww, B, x0, A}, x];
max35 = FindMaximum[model /. fit35, {x, 1}];
Q35 = x /. Flatten[max35][[2]];

fit36 = FindFit[n36, model, {w, ww, B, x0, A}, x];
max36 = FindMaximum[model /. fit36, {x, 7}];
Q36 = x /. Flatten[max36][[2]];

fit37 = FindFit[n37, model, {w, ww, B, x0, A}, x];
max37 = FindMaximum[model /. fit37, {x, 7}];
Q37 = x /. Flatten[max37][[2]];

fit38 = FindFit[n38, model, {w, ww, B, x0, A}, x];
max38 = FindMaximum[model /. fit38, {x, 1}];
Q38 = x /. Flatten[max38][[2]];

fit39 = FindFit[n39, model, {w, ww, B, x0, A}, x];
max39 = FindMaximum[model /. fit39, {x, 5}];
Q39 = x /. Flatten[max39][[2]];
```

```
fit40 = FindFit[n40, model, {w, ww, B, x0, A}, x];
max40 = FindMaximum[model /. fit40, {x, 7}];
Q40 = x /. Flatten[max40][[2]];
```

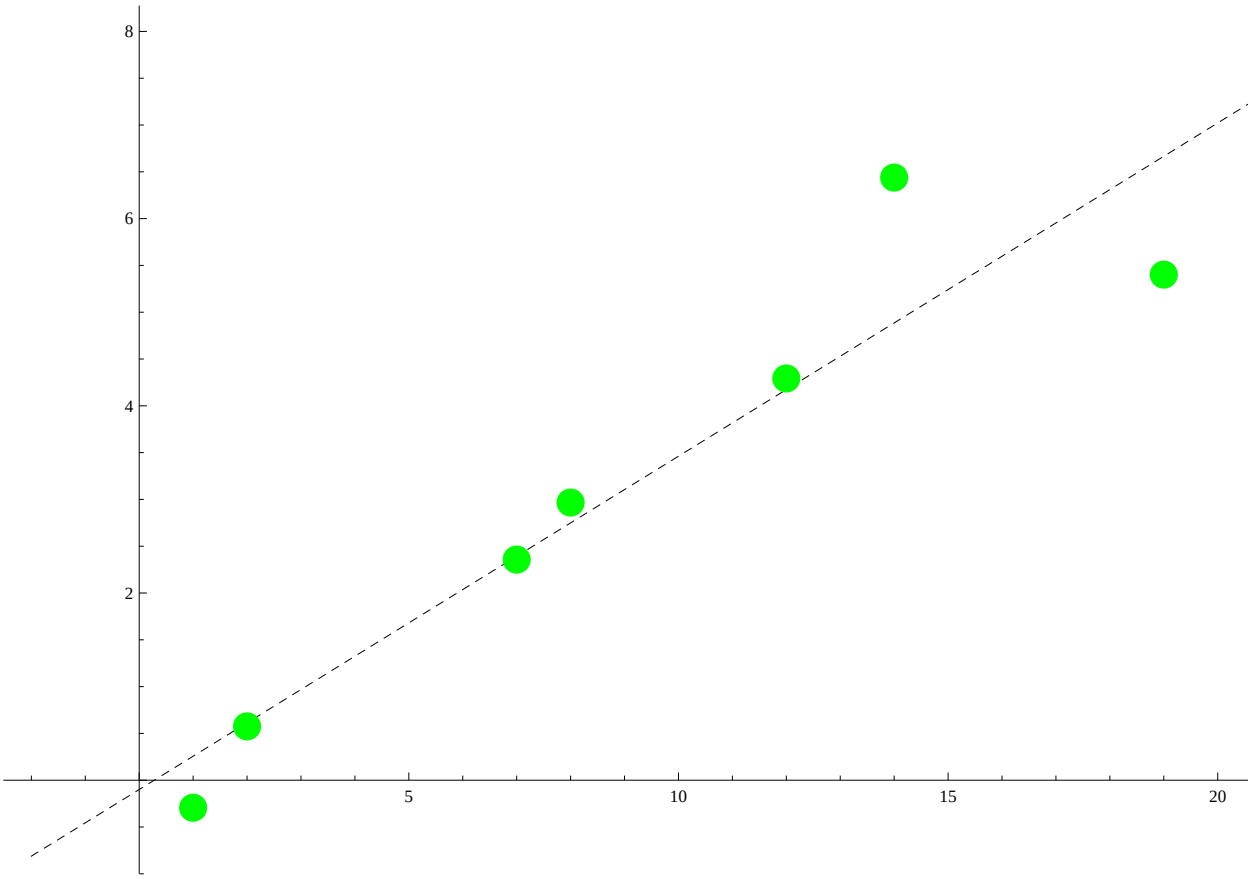
FindFit::cvmit : Failed to converge to the requested accuracy or precision within 100 iterations. ≫

```
fit41 = FindFit[n41, model, {w, ww, B, x0, A}, x];
max41 = FindMaximum[model /. fit41, {x, 9}];
Q41 = x /. Flatten[max41][[2]];
```

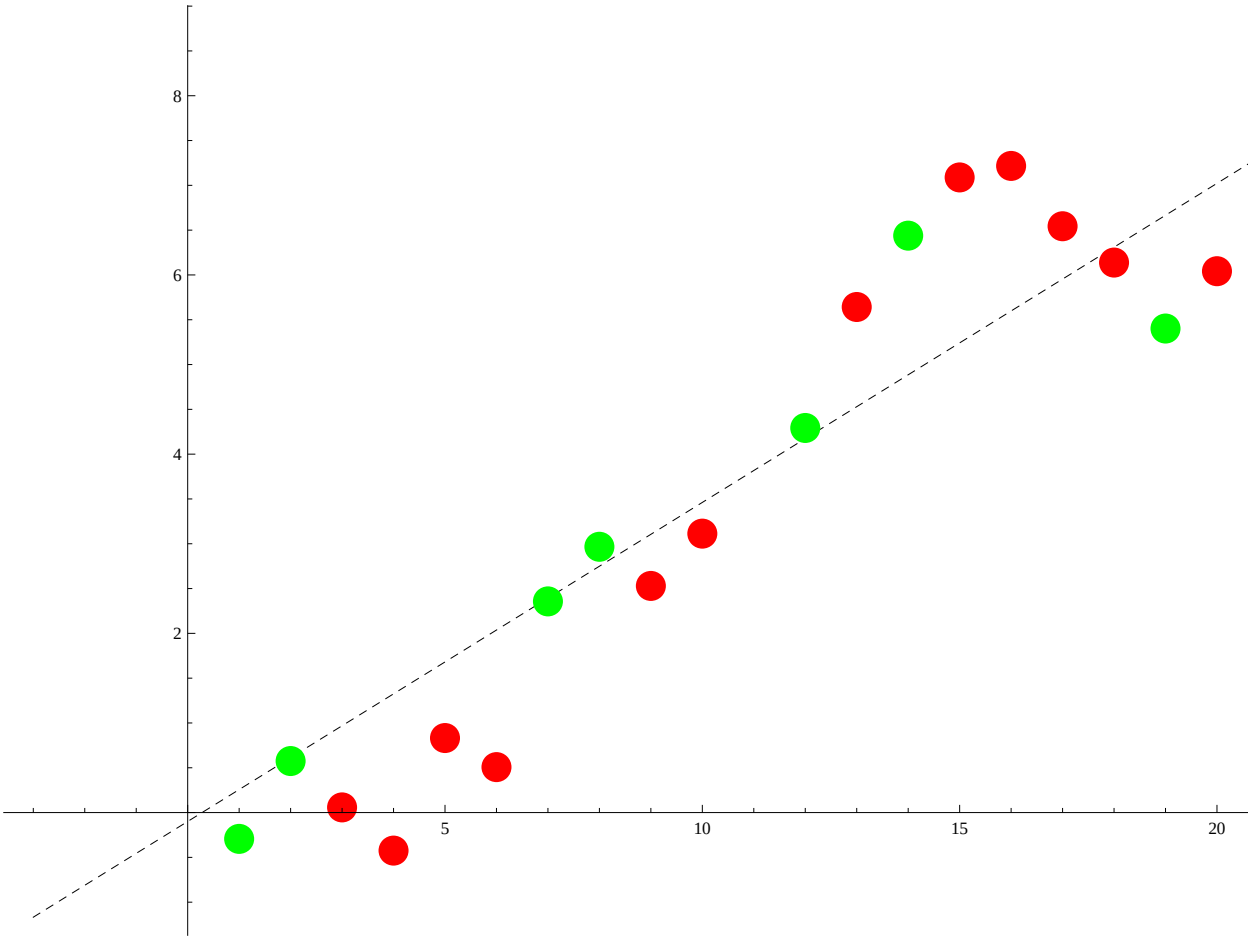
```
dd = {{1, Q21}, {2, Q22}, {7, Q27}, {8, Q28}, {12, Q32}, {14, Q34}, {19, Q39}};
dd1 = {{3, Q23}, {4, Q24}, {5, Q25}, {6, Q26}, {9, Q29}, {10, Q30}};
dd2 = {{13, Q33}, {15, Q35}, {16, Q36}, {17, Q37}, {18, Q38}, {20, Q40}, {21, Q41}};
```

```
fitt = FindFit[dd, A * xx + B, {A, B}, xx];
```

```
Show[Plot[A * x + B /. fitt, {x, -2, 23}, PlotStyle → {Black, Dashed}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}]]
```



```
Show[Plot[A * x + B /. fitt, {x, -3, 25}, PlotStyle → {Black, Dashed}],
 ListPlot[dd1, PlotStyle → {Red, PointSize[0.02]}],
 ListPlot[dd2, PlotStyle → {Red, PointSize[0.02]}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}]]
```



N2

```
n49 = Import["ATKTETRO.0492.dat", {"Table"}];
n50 = Import["ATKTETRO.0502.dat", {"Table"}];
n51 = Import["ATKTETRO.0512.dat", {"Table"}];
n52 = Import["ATKTETRO.0522.dat", {"Table"}];
n53 = Import["ATKTETRO.0532.dat", {"Table"}];
n54 = Import["ATKTETRO.0542.dat", {"Table"}];
n55 = Import["ATKTETRO.0552.dat", {"Table"}];
n56 = Import["ATKTETRO.0562.dat", {"Table"}];
n57 = Import["ATKTETRO.0572.dat", {"Table"}];
n58 = Import["ATKTETRO.0582.dat", {"Table"}];
n59 = Import["ATKTETRO.0592.dat", {"Table"}];
n60 = Import["ATKTETRO.0602.dat", {"Table"}];
n61 = Import["ATKTETRO.0612.dat", {"Table"}];
n62 = Import["ATKTETRO.0622.dat", {"Table"}];
n63 = Import["ATKTETRO.0632.dat", {"Table"}];
n64 = Import["ATKTETRO.0642.dat", {"Table"}];
```

```
fit49 = FindFit[n49, model, {w, ww, B, x0, A}, x];
max49 = FindMaximum[model /. fit49, {x, 0}];
Q49 = x /. Flatten[max49][[2]];
```

```
fit50 = FindFit[n50, model, {w, ww, B, x0, A}, x];
max50 = FindMaximum[model /. fit50, {x, 0}];
Q50 = x /. Flatten[max50][[2]];
```

```
fit51 = FindFit[n51, model, {w, ww, B, x0, A}, x];
max51 = FindMaximum[model /. fit51, {x, 3}];
Q51 = x /. Flatten[max51][[2]];
```

```
fit52 = FindFit[n52, model, {w, ww, B, x0, A}, x];
max52 = FindMaximum[model /. fit52, {x, 0}];
Q52 = x /. Flatten[max52][[2]];
```

```
fit53 = FindFit[n53, model, {w, ww, B, x0, A}, x];
max53 = FindMaximum[model /. fit53, {x, 0}];
Q53 = x /. Flatten[max53][[2]];
```

```
fit54 = FindFit[n54, model, {w, ww, B, x0, A}, x];
max54 = FindMaximum[model /. fit54, {x, 1}];
Q54 = x /. Flatten[max54][[2]];
```

FindFit::sszero :

The step size in the search has become less than the tolerance prescribed by the PrecisionGoal option, but the gradient is larger than the tolerance specified by the AccuracyGoal option. There is a possibility that the method has stalled at a point that is not a local minimum. ≫

```
fit55 = FindFit[n55, model, {w, ww, B, x0, A}, x];
max55 = FindMaximum[model /. fit55, {x, 0}];
Q55 = x /. Flatten[max55][[2]];
```

```
fit56 = FindFit[n56, model, {w, ww, B, x0, A}, x];
max56 = FindMaximum[model /. fit56, {x, 0}];
Q56 = x /. Flatten[max56][[2]];
```

```
fit57 = FindFit[n57, model, {w, ww, B, x0, A}, x];
max57 = FindMaximum[model /. fit57, {x, 0}];
Q57 = x /. Flatten[max57][[2]];
```

```
fit58 = FindFit[n58, model, {w, ww, B, x0, A}, x];
max58 = FindMaximum[model /. fit58, {x, 0}];
Q58 = x /. Flatten[max58][[2]];
```

FindMaximum::lstol :
The line search decreased the step size to within the tolerance specified by AccuracyGoal and PrecisionGoal but was unable to find a sufficient increase in the function. You may need more than MachinePrecision digits of working precision to meet these tolerances. ≫

```
fit59 = FindFit[n59, model, {w, ww, B, x0, A}, x];
max59 = FindMaximum[model /. fit59, {x, 0}];
Q59 = x /. Flatten[max59][[2]];
```

```
fit60 = FindFit[n60, model, {w, ww, B, x0, A}, x];
max60 = FindMaximum[model /. fit60, {x, 0}];
Q60 = x /. Flatten[max60][[2]];
```

```
fit61 = FindFit[n61, model, {w, ww, B, x0, A}, x];
max61 = FindMaximum[model /. fit61, {x, 0}];
Q61 = x /. Flatten[max61][[2]];
```

FindFit::sszero :
The step size in the search has become less than the tolerance prescribed by the PrecisionGoal option, but the gradient is larger than the tolerance specified by the AccuracyGoal option. There is a possibility that the method has stalled at a point that is not a local minimum. ≫

```
fit62 = FindFit[n62, model, {w, ww, B, x0, A}, x];
max62 = FindMaximum[model /. fit62, {x, 0}];
Q62 = x /. Flatten[max62][[2]];
```

```
fit63 = FindFit[n63, model, {w, ww, B, x0, A}, x];
max63 = FindMaximum[model /. fit63, {x, 0}];
Q63 = x /. Flatten[max63][[2]];
```

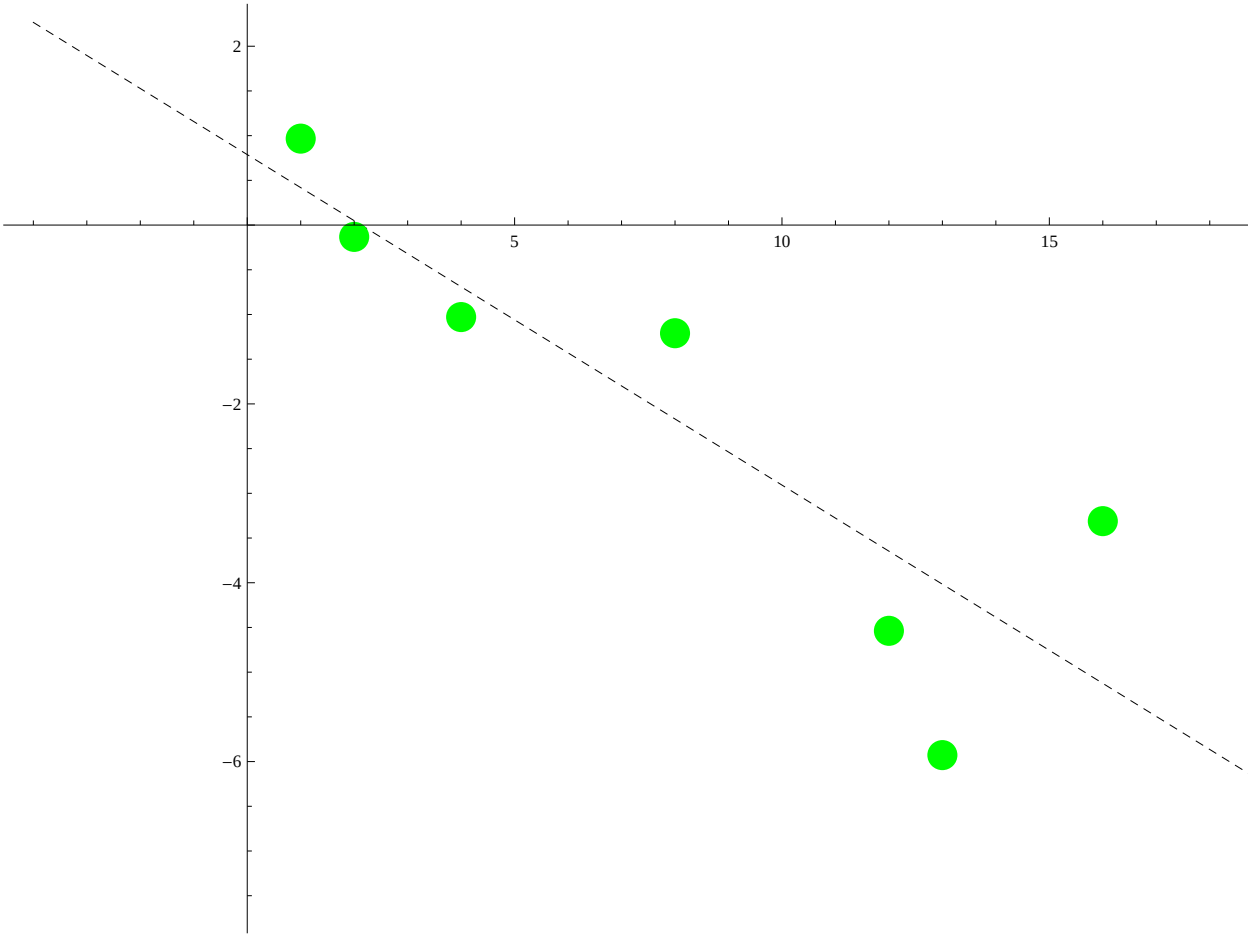
FindMaximum::lstol :
The line search decreased the step size to within the tolerance specified by AccuracyGoal and PrecisionGoal but was unable to find a sufficient increase in the function. You may need more than MachinePrecision digits of working precision to meet these tolerances. ≫

```
fit64 = FindFit[n64, model, {w, ww, B, x0, A}, x];
max64 = FindMaximum[model /. fit64, {x, 0}];
Q64 = x /. Flatten[max64][[2]];
```

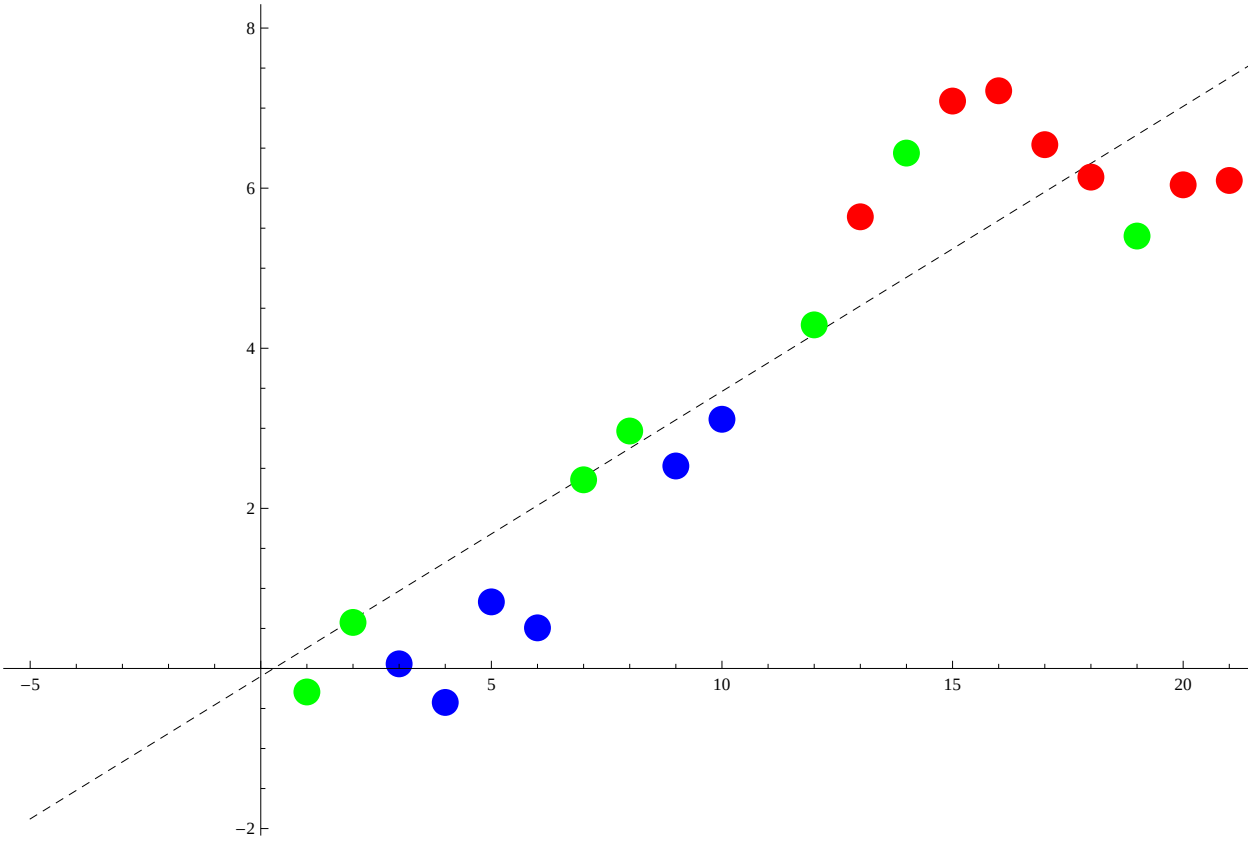
```
dd = {{1, Q49}, {2, Q50}, {4, Q52}, {8, Q56}, {12, Q60}, {13, Q61}, {16, Q64}};
dd1 = {{3, Q51}, {9, Q57}, {10, Q58}, {11, Q59}};
dd2 = {{5, Q53}, {6, Q54}, {7, Q55}, {14, Q62}, {15, Q63}};
```

```
fitt = FindFit[dd, A * xx + B, {A, B}, xx];
```

```
Show[Plot[A * x + B /. fitt, {x, -4, 23}, PlotStyle → {Black, Dashed}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}]]
```



```
Show[Plot[A * x + B /. fitt, {x, -5, 23}, PlotStyle → {Black, Dashed}],
 ListPlot[dd1, PlotStyle → {Blue, PointSize[0.02]}],
 ListPlot[dd2, PlotStyle → {Red, PointSize[0.02]}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}]]
```



$$d33 = \frac{\delta\Theta * d}{1000 * \text{Tan}[\Theta]}$$

```
Θ = 7.93 * Pi / 180;
d = 0.65 * 10^-3;
d33 = 8.76 * 10^-12;
d33 = 19.4 * 10^-12;
```

$$\delta\Theta = \frac{1000 * \text{Tan}[\Theta] * d33}{d} * 3600 / Pi * 180 * 2$$

```
1.71506
```

```
n102 = Import["ATKTETRO.1022.dat", {"Table"}];
n103 = Import["ATKTETRO.1032.dat", {"Table"}];
n104 = Import["ATKTETRO.1042.dat", {"Table"}];
n105 = Import["ATKTETRO.1052.dat", {"Table"}];
n106 = Import["ATKTETRO.1062.dat", {"Table"}];
n107 = Import["ATKTETRO.1072.dat", {"Table"}];
n108 = Import["ATKTETRO.1082.dat", {"Table"}];
```

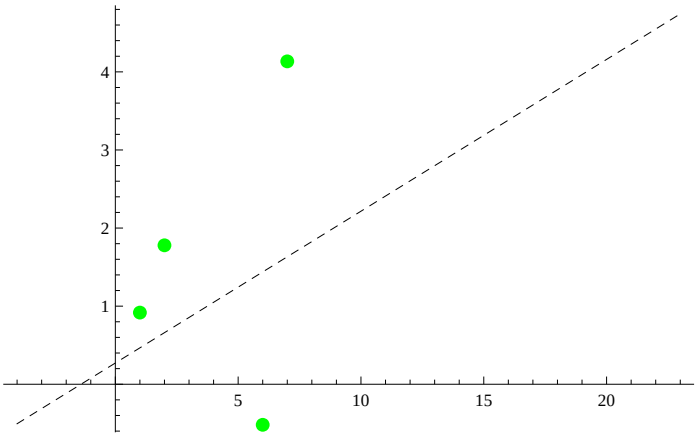
```
fit102 = FindFit[n102, model, {w, ww, B, x0, A}, x];
max102 = FindMaximum[model /. fit102, {x, 0}];
Q102 = x /. Flatten[max102][[2]];

fit103 = FindFit[n103, model, {w, ww, B, x0, A}, x];
max103 = FindMaximum[model /. fit103, {x, 1}];
Q103 = x /. Flatten[max103][[2]];
```

FindMaximum::lstol :
The line search decreased the step size to within the tolerance specified by AccuracyGoal and PrecisionGoal but was unable to find a sufficient increase in the function. You may need more than MachinePrecision digits of working precision to meet these tolerances. ≫

```
fit104 = FindFit[n104, model, {w, ww, B, x0, A}, x];
max104 = FindMaximum[model /. fit104, {x, 0}];
Q104 = x /. Flatten[max104][[2]];

fit105 = FindFit[n105, model, {w, ww, B, x0, A}, x];
max105 = FindMaximum[model /. fit105, {x, 0}];
Q105 = x /. Flatten[max105][[2]];

fit106 = FindFit[n106, model, {w, ww, B, x0, A}, x];
max106 = FindMaximum[model /. fit106, {x, 0}];
Q106 = x /. Flatten[max106][[2]];

fit107 = FindFit[n107, model, {w, ww, B, x0, A}, x];
max107 = FindMaximum[model /. fit107, {x, 0}];
Q107 = x /. Flatten[max107][[2]];

fit108 = FindFit[n108, model, {w, ww, B, x0, A}, x];
max108 = FindMaximum[model /. fit108, {x, 4}];
Q108 = x /. Flatten[max108][[2]];
```

FindFit::cvmit : Failed to converge to the requested accuracy or precision within 100 iterations. ≫

```
dd = {{1, Q102}, {2, Q103}, {4, Q105}, {6, Q107}, {7, Q108}};
ddplus = {{5, Q106}};
ddminus = {{3, Q104}};

fitt = FindFit[dd, A * xx + B, {A, B}, xx];

Show[Plot[A * x + B /. fitt, {x, -4, 23}, PlotStyle → {Black, Dashed}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}]]
```



```
Show[Plot[A * x + B /. fitt, {x, -60, 60}, PlotStyle → {Black, Dashed}],
 ListPlot[ddplus, PlotStyle → {Blue, PointSize[0.02]}],
 ListPlot[ddminus, PlotStyle → {Red, PointSize[0.02]}],
 ListPlot[dd, PlotStyle → {Green, PointSize[0.02]}], PlotRange → {{0, 9}, {-10, 5}}]
```