```
data = Import["~/Desktop/Data1.txt", "Table"]
```

```
{{X, Y}, {0., 3.4039}, {0.5, 3.9881}, {1., 4.2004}, {1.5, 5.0291}, {2., 5.188},
 {2.5, 5.3914}, {3., 5.7904}, {3.5, 5.4771}, {4., 5.784}, {4.5, 5.9271}, {5., 7.1422},
 {5.5, 7.1213}, {6., 6.8499}, {6.5, 7.936}, {7., 8.3686}, {7.5, 8.2178},
 {8., 8.8891}, {8.5, 8.8176}, {9., 8.8702}, {9.5, 9.8769}, {10., 9.7354}}
```

```
data = Rest[data]
```

```
{{0., 3.4039}, {0.5, 3.9881}, {1., 4.2004}, {1.5, 5.0291}, {2., 5.188}, {2.5, 5.3914},
 {3., 5.7904}, {3.5, 5.4771}, {4., 5.784}, {4.5, 5.9271}, {5., 7.1422},
 {5.5, 7.1213}, {6., 6.8499}, {6.5, 7.936}, {7., 8.3686}, {7.5, 8.2178},
 {8., 8.8891}, {8.5, 8.8176}, {9., 8.8702}, {9.5, 9.8769}, {10., 9.7354}}
```

```
fit = LinearModelFit[data, x, x]
```

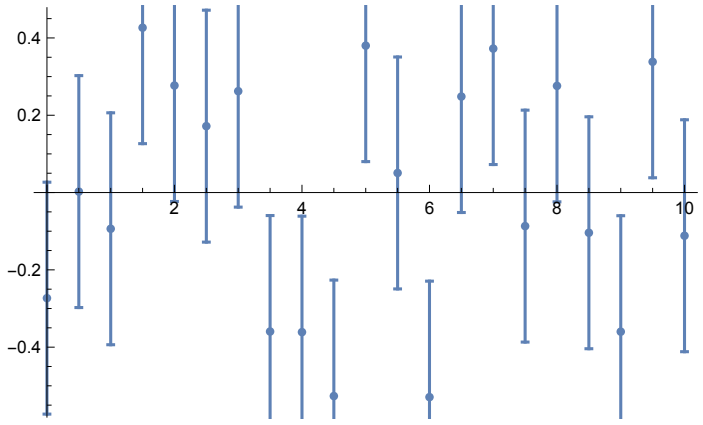
```
FittedModel[ 3.6771 + 0.617003 x ]
```

```
residualsData =
 Table[{{data[[i, 1]], data[[i, 2]] - fit[data[[i, 1]]]}, ErrorBar[0.3]},
  {i, 1, Length[data]}]
```

```
{{{0., -0.273203}, ErrorBar[0.3]},
 {{0.5, 0.00249498}, ErrorBar[0.3]}, {{1., -0.0937066}, ErrorBar[0.3]},
 {{1.5, 0.426492}, ErrorBar[0.3]}, {{2., 0.27689}, ErrorBar[0.3]},
 {{2.5, 0.171789}, ErrorBar[0.3]}, {{3., 0.262287}, ErrorBar[0.3]},
 {{3.5, -0.359514}, ErrorBar[0.3]}, {{4., -0.361116}, ErrorBar[0.3]},
 {{4.5, -0.526517}, ErrorBar[0.3]}, {{5., 0.380081}, ErrorBar[0.3]},
 {{5.5, 0.0506794}, ErrorBar[0.3]}, {{6., -0.529222}, ErrorBar[0.3]},
 {{6.5, 0.248376}, ErrorBar[0.3]}, {{7., 0.372475}, ErrorBar[0.3]},
 {{7.5, -0.0868268}, ErrorBar[0.3]}, {{8., 0.275972}, ErrorBar[0.3]},
 {{8.5, -0.10403}, ErrorBar[0.3]}, {{9., -0.359932}, ErrorBar[0.3]},
 {{9.5, 0.338267}, ErrorBar[0.3]}, {{10., -0.111735}, ErrorBar[0.3]}}
```

```
Needs["ErrorBarPlots`"]
```

```
ErrorListPlot[residualsData]
```



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```
LorentzData = Import["~/Desktop/LorentzianData.txt", "Table"]
```

```
{{-2., 0.26}, {-1.9, 0.69}, {-1.8, 0.4}, {-1.7, 0.86}, {-1.6, 0.72}, {-1.5, 0.54},
 {-1.4, 0.52}, {-1.3, 0.68}, {-1.2, 0.96}, {-1.1, 0.73}, {-1., 1.06},
 {-0.9, 1.17}, {-0.8, 1.04}, {-0.7, 1.}, {-0.6, 1.19}, {-0.5, 1.65}, {-0.4, 1.34},
 {-0.3, 1.9}, {-0.2, 1.75}, {-0.1, 1.64}, {0., 1.72}, {0.1, 1.98}, {0.2, 1.75},
 {0.3, 1.99}, {0.4, 2.19}, {0.5, 2.45}, {0.6, 2.28}, {0.7, 2.08}, {0.8, 2.1},
 {0.9, 2.13}, {1., 1.79}, {1.1, 1.7}, {1.2, 1.85}, {1.3, 1.9}, {1.4, 1.94},
 {1.5, 1.72}, {1.6, 1.43}, {1.7, 1.23}, {1.8, 1.56}, {1.9, 1.16}, {2., 1.25}}
```

```
Clear[a, c, w]
```

```
fitLorentz = NonlinearModelFit[LorentzData,
  a / (1 + ((x - c) / w) ^ 2), {{a, 2.5}, {c, 1}, {w, 1}}, x]
```

$$\text{FittedModel}\left[\frac{2.16987}{1+0.467867\,(-0.630755+x)^2}\right]$$

```
residualsDataLorentz = Table[
  {{LorentzData[[i, 1]], LorentzData[[i, 2]] - fitLorentz[LorentzData[[i, 1]]]},
   ErrorBar[0.3]}, {i, 1, Length[LorentzData]}]
```

```
{{{-2., -0.251997}, ErrorBar[0.3]},
 {{-1.9, 0.147066}, ErrorBar[0.3]}, {{-1.8, -0.176414}, ErrorBar[0.3]},
 {{-1.7, 0.247329}, ErrorBar[0.3]}, {{-1.6, 0.0680423}, ErrorBar[0.3]},
 {{-1.5, -0.154541}, ErrorBar[0.3]}, {{-1.4, -0.220703}, ErrorBar[0.3]},
 {{-1.3, -0.110733}, ErrorBar[0.3]}, {{-1.2, 0.11508}, ErrorBar[0.3]},
 {{-1.1, -0.173546}, ErrorBar[0.3]}, {{-1., 0.0931344}, ErrorBar[0.3]},
 {{-0.9, 0.134912}, ErrorBar[0.3]}, {{-0.8, -0.0683461}, ErrorBar[0.3]},
 {{-0.7, -0.18666}, ErrorBar[0.3]}, {{-0.6, -0.0798895}, ErrorBar[0.3]},
 {{-0.5, 0.292321}, ErrorBar[0.3]}, {{-0.4, -0.109392}, ErrorBar[0.3]},
 {{-0.3, 0.355957}, ErrorBar[0.3]}, {{-0.2, 0.109765}, ErrorBar[0.3]},
 {{-0.1, -0.0961127}, ErrorBar[0.3]}, {{0., -0.109349}, ErrorBar[0.3]},
 {{0.1, 0.062815}, ErrorBar[0.3]}, {{0.2, -0.246542}, ErrorBar[0.3]},
 {{0.3, -0.0742123}, ErrorBar[0.3]}, {{0.4, 0.0728765}, ErrorBar[0.3]},
 {{0.5, 0.297352}, ErrorBar[0.3]}, {{0.6, 0.111093}, ErrorBar[0.3]},
 {{0.7, -0.0850102}, ErrorBar[0.3]}, {{0.8, -0.041172}, ErrorBar[0.3]},
 {{0.9, 0.0313143}, ErrorBar[0.3]}, {{1., -0.249751}, ErrorBar[0.3]},
 {{1.1, -0.267205}, ErrorBar[0.3]}, {{1.2, -0.0342065}, ErrorBar[0.3]},
 {{1.3, 0.106058}, ErrorBar[0.3]}, {{1.4, 0.240616}, ErrorBar[0.3]},
 {{1.5, 0.116865}, ErrorBar[0.3]}, {{1.6, -0.0773423}, ErrorBar[0.3]},
 {{1.7, -0.183681}, ErrorBar[0.3]}, {{1.8, 0.236618}, ErrorBar[0.3]},
 {{1.9, -0.0772891}, ErrorBar[0.3]}, {{2., 0.0940773}, ErrorBar[0.3]}}
```

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```
ErrorListPlot[residualsDataLorentz]
```