

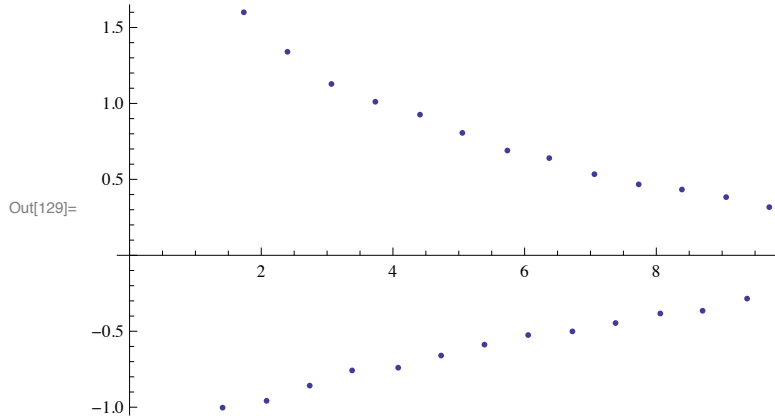
■ Analysis of OFIS Vertical Mode Ringdown Data, 4/23/14, Mark Barton and Gerardo

■ Set 4, final configuration

```
In[128]:= data = Import["/Users/mbarton/Desktop/OFIS/OFIS4.txt", "TSV"]
```

```
Out[128]:= {{1.413, -1.003}, {1.735, 1.6}, {2.081, -0.958}, {2.398, 1.34},  
{2.736, -0.858}, {3.066, 1.128}, {3.38, -0.758}, {3.733, 1.011},  
{4.08, -0.74}, {4.411, 0.926}, {4.732, -0.66}, {5.054, 0.806}, {5.39, -0.588},  
{5.738, 0.69}, {6.054, -0.525}, {6.374, 0.64}, {6.726, -0.501}, {7.06, 0.534},  
{7.381, -0.446}, {7.733, 0.467}, {8.061, -0.383}, {8.389, 0.433},  
{8.703, -0.365}, {9.061, 0.383}, {9.379, -0.285}, {9.716, 0.317}}
```

```
In[129]:= ListPlot[data]
```



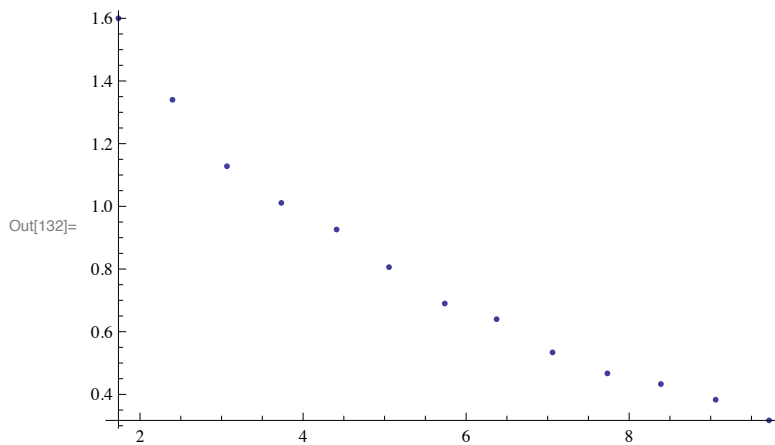
```
In[130]:= evens = data[[1 ;; -1 ;; 2]]
```

```
Out[130]:= {{1.413, -1.003}, {2.081, -0.958}, {2.736, -0.858}, {3.38, -0.758},  
{4.08, -0.74}, {4.732, -0.66}, {5.39, -0.588}, {6.054, -0.525}, {6.726, -0.501},  
{7.381, -0.446}, {8.061, -0.383}, {8.703, -0.365}, {9.379, -0.285}}
```

```
In[131]:= odds = data[[2 ;; -1 ;; 2]]
```

```
Out[131]:= {{1.735, 1.6}, {2.398, 1.34}, {3.066, 1.128}, {3.733, 1.011},  
{4.411, 0.926}, {5.054, 0.806}, {5.738, 0.69}, {6.374, 0.64}, {7.06, 0.534},  
{7.733, 0.467}, {8.389, 0.433}, {9.061, 0.383}, {9.716, 0.317}}
```

```
In[132]:= ListPlot[odds]
```



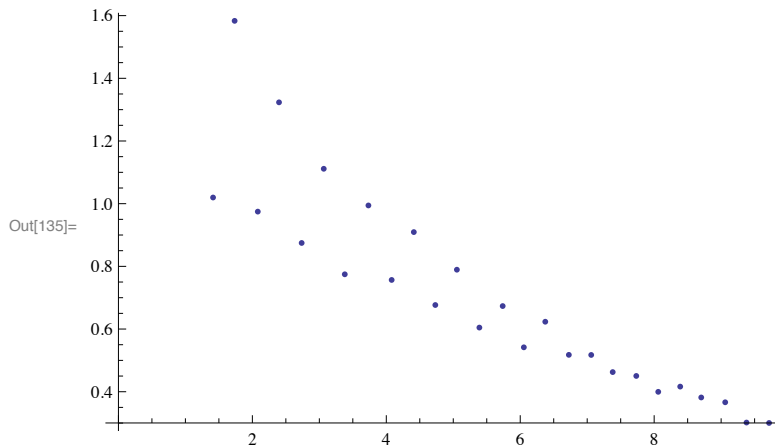
```
In[133]:= mean = Mean[data[[-6 ;; -1, 2]]]
```

```
Out[133]= 0.0166667
```

```
In[134]:= diff = Join[odds /. {x_, y_} -> {x, y - mean}, evens /. {x_, y_} -> {x, mean - y}]
```

```
Out[134]:= {{1.735, 1.58333}, {2.398, 1.32333}, {3.066, 1.11133}, {3.733, 0.994333}, {4.411, 0.909333},
{5.054, 0.789333}, {5.738, 0.673333}, {6.374, 0.623333}, {7.06, 0.517333},
{7.733, 0.450333}, {8.389, 0.416333}, {9.061, 0.366333}, {9.716, 0.300333},
{1.413, 1.01967}, {2.081, 0.974667}, {2.736, 0.874667}, {3.38, 0.774667}, {4.08, 0.756667},
{4.732, 0.676667}, {5.39, 0.604667}, {6.054, 0.541667}, {6.726, 0.517667},
{7.381, 0.462667}, {8.061, 0.399667}, {8.703, 0.381667}, {9.379, 0.301667}}
```

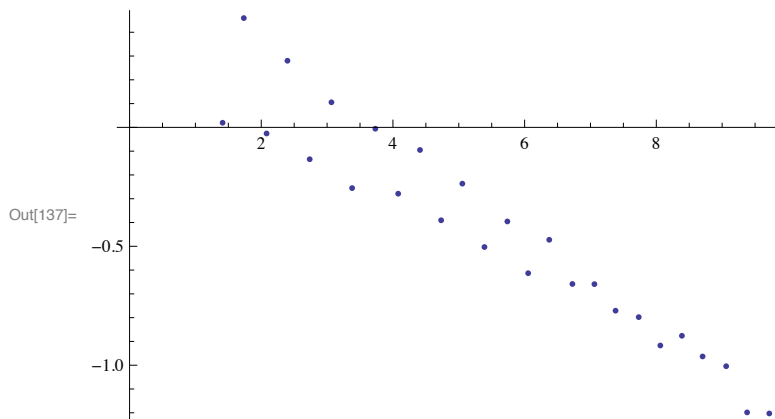
```
In[135]:= ListPlot[diff]
```



```
In[136]:= log = diff /. {x_, y_} -> {x, Log[y]}
```

```
Out[136]:= {{1.735, 0.459532}, {2.398, 0.280154}, {3.066, 0.10556},
{3.733, -0.00568278}, {4.411, -0.0950435}, {5.054, -0.236567},
{5.738, -0.395515}, {6.374, -0.472674}, {7.06, -0.659068}, {7.733, -0.797767},
{8.389, -0.876269}, {9.061, -1.00421}, {9.716, -1.20286}, {1.413, 0.0194758},
{2.081, -0.0256597}, {2.736, -0.133912}, {3.38, -0.255322}, {4.08, -0.278832},
{4.732, -0.390576}, {5.39, -0.503078}, {6.054, -0.613104}, {6.726, -0.658424},
{7.381, -0.770748}, {8.061, -0.917124}, {8.703, -0.963208}, {9.379, -1.19843}}
```

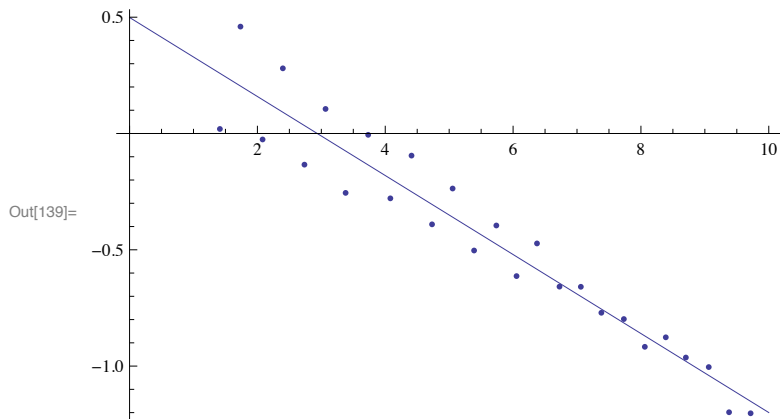
```
In[137]:= lp = ListPlot[log]
```



```
In[138]:= fit = Fit[log, {1, x}, x]
```

```
Out[138]:= 0.498735 - 0.169842 x
```

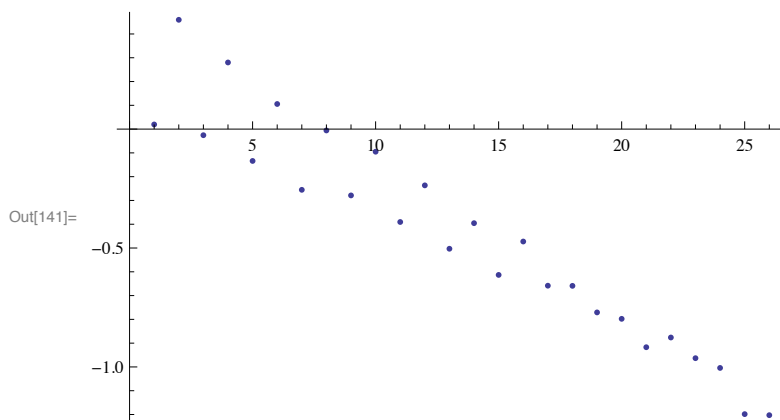
In[139]:= **Show[Plot[fit, {x, 0, 10}], lp]**



In[140]:= **peaks = Rifle[evens /. {x_, y_} => mean - y, odds /. {x_, y_} => y - mean]**

Out[140]= {1.01967, 1.58333, 0.974667, 1.32333, 0.874667, 1.11133, 0.774667, 0.994333, 0.756667,
0.909333, 0.676667, 0.789333, 0.604667, 0.673333, 0.541667, 0.623333, 0.517667, 0.517333,
0.462667, 0.450333, 0.399667, 0.416333, 0.381667, 0.366333, 0.301667, 0.300333}

In[141]:= **ListPlot[Log[peaks]]**



In[142]:= **fitp = Fit[Log[peaks], {1, n}, n]**

Out[142]= 0.316215 - 0.0564415 n

In[143]:= **logdec = -2 Coefficient[fitp, n]**

Out[143]= 0.112883

In[144]:= **Q = Sqrt[1 + (2 Pi / logdec) ^ 2] / 2**

Out[144]= 27.835