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LeeSmithSBCC / Jupyter-Math-For-Nerds

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Jupyter-Math-For-Nerds / Jupiter-Files / MathWithSumpy_PLOT_DERIVATIVES_082918.ipynb

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LeeSmithSBCC Added Plot Derivatives

6e8b56a 8 minutes ago

1 contributor

164 lines (163 sloc) 83 KB

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History



Advanced Plotting

- Algebra
- Derivatives

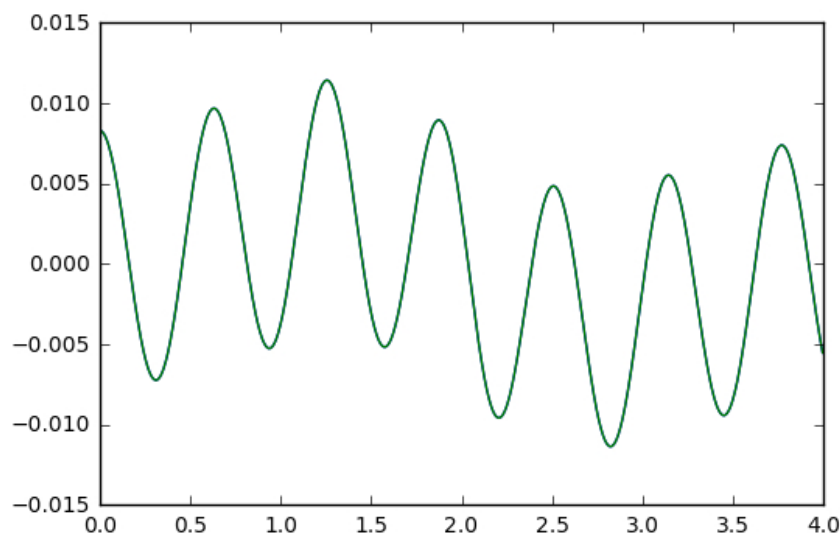
```
In [10]: from numpy import *
         from pylab import *

         # example data with some peaks:
         x = linspace(0,4,1e3)
         data = .2*sin(10*x)+ exp(-abs(2-x)**2)
```

```
In [11]: firstDeriv = diff(data)
```

```
Out[11]: array([ 0.0082926 ,  0.00827116,  0.008237  ,  0.00819017])
```

```
In [33]: plot(x[0:999], (firstDeriv));
         plt.show()
```



```
In [35]: a = diff(sign(diff(data))).nonzero()[0] + 1 # local min+max
         b = (diff(sign(diff(data))) > 0).nonzero()[0] + 1 # local min
         c = (diff(sign(diff(data))) < 0).nonzero()[0] + 1 # local max
```

```
In [36]: print('a min-max',a)
         print('b local min',b)
         print('c local max',c)

a min-max [ 41 114 204 265 363 425 509 597 656 755 817 905 980]
b local min [114 265 425 597 755 905]
c local max [ 41 204 363 509 656 817 980]
```

```
In [38]: from pylab import *
plot(x,data)
plot(x[0:999], (firstDeriv), label='First Derivative')
plot(x[b], data[b], "o", label="b -- min")
plot(x[c], data[c], "o", label="c -- max")
legend()
show()
```

