

## ***The ACEM (Advanced Computing in Electron Microscopy) Depth Analysis API***

*This API consists of a `DepthProfile` class which has a series of useful functions and properties for analyzing the depth section output of ACEM simulations.*

### ***The Constructor:***

```
DepthProfile(filename, filetype, layer, depth, xstart, xend)
```

*DepthProfile()* takes in the image filename, the image filetype, the layer of the image, the depth in angstroms of the image, and the start and end position of the depth section. When instantiating a `DepthProfile` object, most of the properties will be computed. Those that are not, are probably computational intensive. Here is an example of making a `DepthProfile` object:

```
myDepth = DepthProfile('Sill10stemdepthTitanC20.tif','tif',2,997,16,19)
```

### ***The Properties:***

```
im;  
norm_image;  
lnorm_image;  
depth;  
xstart;  
xend;  
  
curvefit_image;  
dumbbellContrast;
```

### ***The Methods:***

```
DepthProfile(filename, filetype, layer, depth, xstart, xend)  
plot()  
plotLineNormImage()  
plotCfitImage()  
plotLineProfiles(layers,filt,curvefiton)  
plotLineProfile(layer,filt,curvefiton)  
plotDumbbellContrast()
```

### ***The Static Methods:***

```
normImg(img_matrix)  
normImgLines(img_matrix)  
cfitImg(img_matrix)  
valleyPercent(y,filt,curvefiton)  
valleyPercent(y,filt,curvefiton)
```

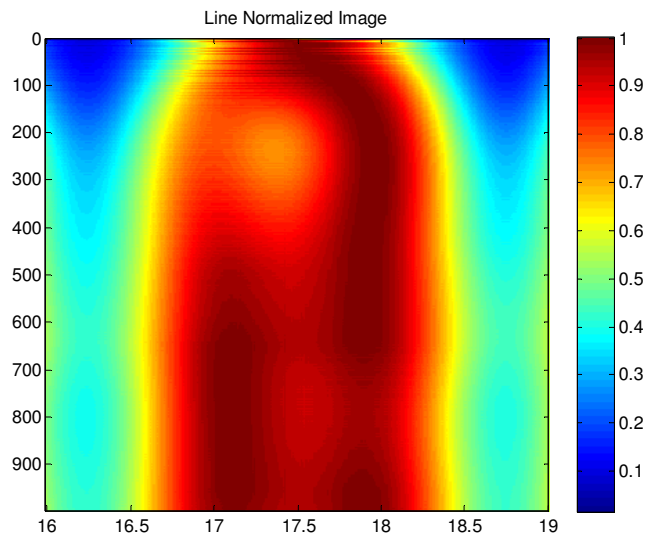
*Examples:*

Create an *DepthProfile* object,

```
myDepth = DepthProfile('Sill10stemdepthTitanC20.tif','tif',2,997,16,19)
```

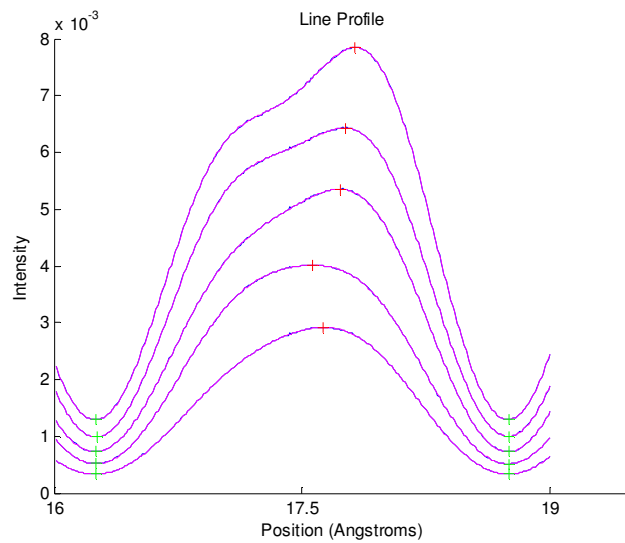
*plot the Line Normalized Image,*

```
myDepth.plotLineNormImage()
```



*plot the Line Profiles of layers 40 through 100 with a 15 step increment and plot a curve fit,*

```
myDepth.plotLineProfiles([40 100 15], 3, 1)
```



*plot the Dumbell Contrast (may take a couple minutes),*

```
myDepth.plotDumbellContrast()
```

