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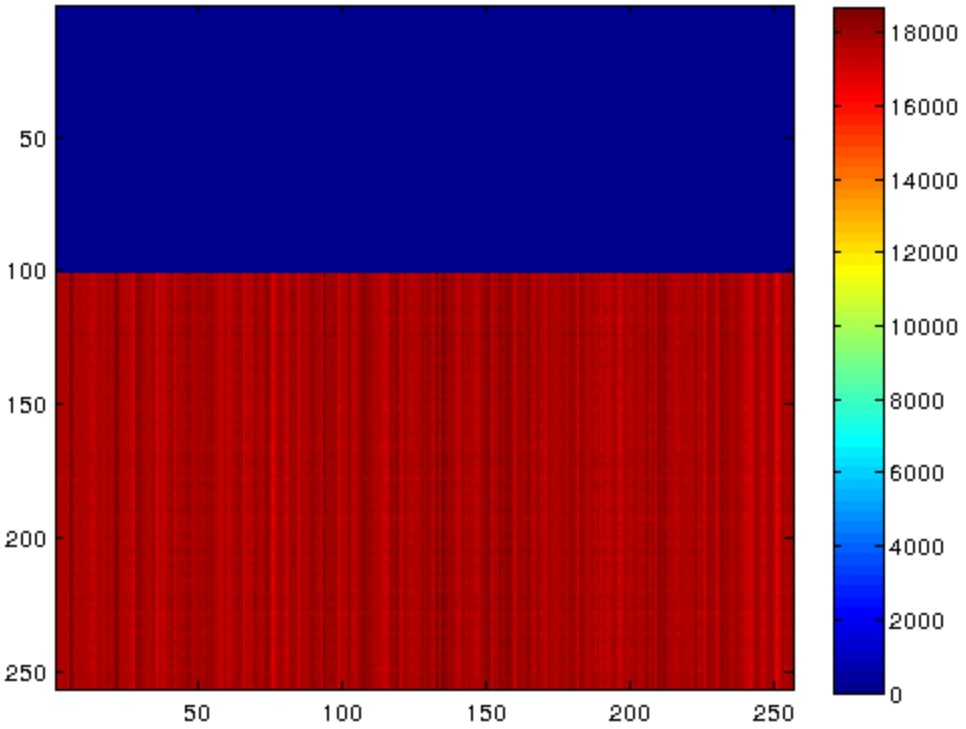
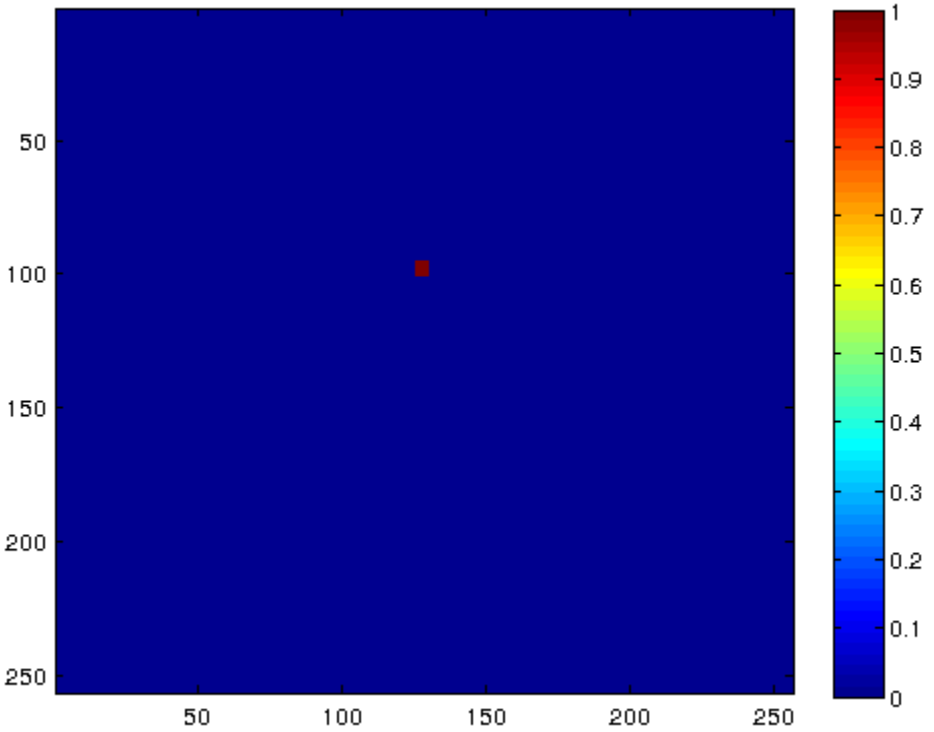
Driver routine for PA source model

```
clear all
close all


% example absorption image , scattering parameter, and anisotropy
npixel =256;
muaimage = 500* rand(npixel ,npixel ); %1/m
mus = 14000; % 1/m
anistropy = .9; % dimensionless
spacing = [.004  .004 .001] ; % m
mutr  = muaimage + mus * (1.0 - anistropy );
mueffimage = sqrt(3.0 * mutr * muaimage);
mueffimage(1:100,:) = 0.0;

% plot input
handle1 = figure(1);
imagesc(mueffimage)
colorbar

% laser location using roi mask
roimask = zeros(npixel ,npixel );
roimask(95:100,126:130) = 1;

% plot input
handle2 = figure(2);
imagesc(roimask,[0 1])
colorbar
```


50
100
150
200
250
50
100
150
200
250
18000
16000
14000
12000
10000
8000
6000
4000
2000
0


50
100
150
200
250
50
100
150
200
250
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

Query the gpu device

GPU must be reset on out of bounds errors reset(gpuDevice(1))

```
deviceInfo = gpuDevice(1);
numSMs = deviceInfo.MultiprocessorCount;
```

Compile and setup thread grid

grid stride loop design pattern, 1-d grid http://devblogs.nvidia.com/parallelforall/cuda-pro-tip-write-flexible-kernels-grid-stride-loops/

```
ssptx = parallel.gpu.CUDAKernel('sdaFluenceModel.ptx', 'sdaFluenceModel.cu');
ssptx.GridSize =[numSMs*8 1];
threadsPerBlock= 768;
ssptx.ThreadBlockSize=[threadsPerBlock  1]
```

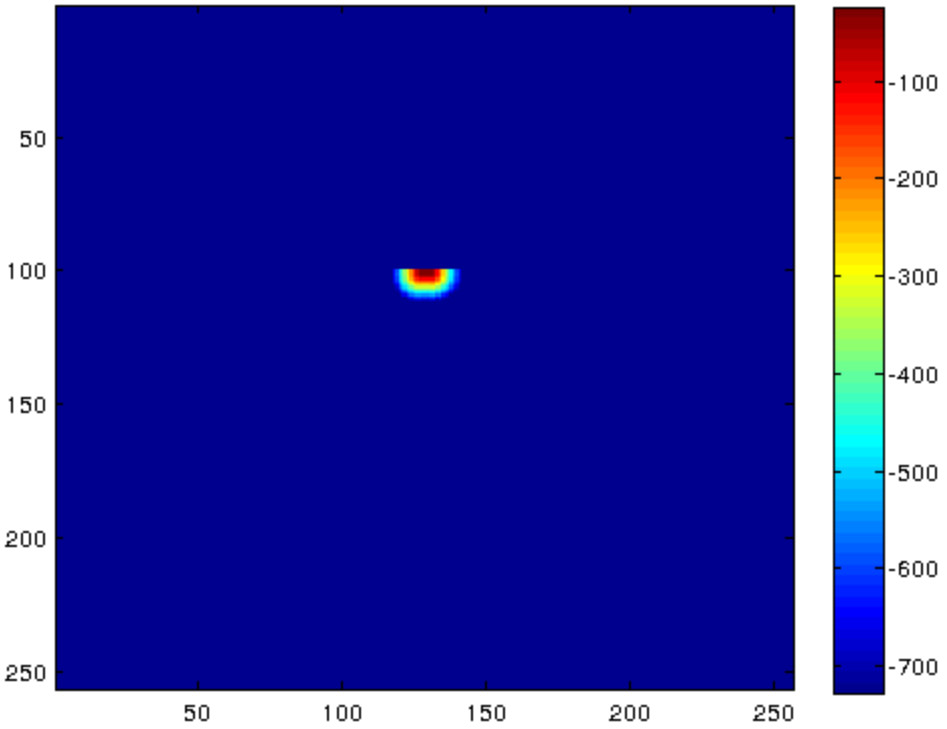
```
ssptx =

  CUDAKernel with properties:

       ThreadBlockSize: [768 1 1]
    MaxThreadsPerBlock: 896
              GridSize: [112 1 1]
      SharedMemorySize: 0
            EntryPoint: '_Z15sdaFluenceModeliPKiPKdidS2_S2_S2_Pddddiii'
    MaxNumLHSArguments: 1
       NumRHSArguments: 15
         ArgumentTypes: {1x15 cell}
```

PA signal = fluence x mua

relative fluence power

```
Power = 1.0;
pasignalimage = PaSignal(ssptx,mueffimage ,spacing,Power, roimask);
max(max(pasignalimage ))
handle3 = figure(3);
imagesc(log(pasignalimage))
colorbar
```

```
ans =

   5.5886e-11
```



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