

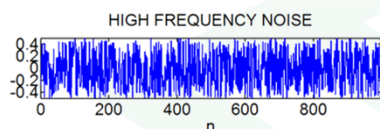


Computational Science:  
Computational Methods in Engineering

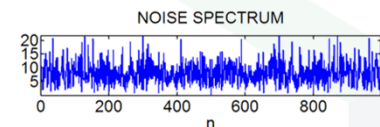
# Generating Low Frequency Noise



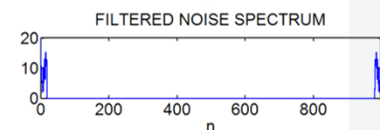
## Creating Low Frequency Noise for 1D Functions



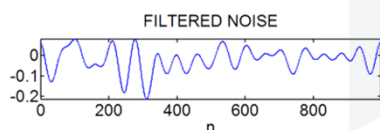
```
% CREATE HIGH FREQUENCY NOISE
N = 1000;
n = [0:N-1];
f = rand(1,N) - 0.5;
```



```
% CALCULATE SPECTRUM
F = fft(f);
```



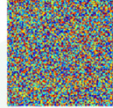
```
% FILTER SPECTRUM
n1 = round(0.02*N);
F(n1:N-n1) = 0;
```



```
% RECONSTRUCT LOW FREQUENCY NOISE
f2 = real(ifft(F));
```

## Creating Low Frequency Noise for 2D Functions

HIGH FREQUENCY NOISE



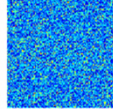
```
% CREATE HIGH FREQUENCY NOISE
```

```
Nx = 128;
```

```
Ny = Nx;
```

```
f = rand(Nx,Ny) - 0.5;
```

NOISE SPECTRUM



```
% CALCULATE SPECTRUM
```

```
F = fft2(f);
```

FILTERED NOISE SPECTRUM



```
% FILTER SPECTRUM
```

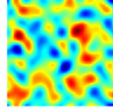
```
nx = round(0.05*Nx);
```

```
ny = round(0.05*Ny);
```

```
F(nx:Nx-nx,:) = 0;
```

```
F(:,ny:Ny-ny) = 0;
```

FILTERED NOISE



```
% RECONSTRUCT LOW FREQUENCY NOISE
```

```
f2 = real(ifft2(F));
```