```
close all
clearvars -except mapCD
load RawData\'1T-TaS2(point defect)'\lattCoord.mat
addpath myFunction\myftn\
fn = 'RawData\1T-TaS2(point defect)\mapCD.mat';
loadif(fn);
```

```
fldNm = 1×1 cell array
    {'mapCD'}
Your variables are:

fldNm  fn     mt
ans =
'already'
```

```
addpath ..\..\..\gitTmp\
addpath D:\github\climsc\clim-scaling-Robust-Standard-Minmax\
```

Masked FFT filter

Cal

```
iph = 1
```

```
iph =
1
```

```
Z = mapCD.dt(iph).Z;
fZ = fft2(Z);
```

graphic

```
f_maskedFFT = figure(3);
f= f_maskedFFT;
msb = 2;
nsb = 3;
p = 0;
for isb = 1:msb
    for jsb = 1:nsb
        p = p + 1;
        sbs(isb,jsb)=subplot(msb,nsb,p)
    end
end
```

```
sbs =
  Axes with properties:

            XLim: [0 1]
            YLim: [0 1]
          XScale: 'linear'
          YScale: 'linear'
   GridLineStyle: '-'
        Position: [0.1300 0.5838 0.2134 0.3412]
           Units: 'normalized'
```

```
  Show all properties
sbs =
  1×2 Axes array:

    Axes    Axes
sbs =
  1×3 Axes array:

    Axes    Axes    Axes
sbs =
  2×3 graphics array:

    Axes                  Axes                 Axes
    Axes                  GraphicsPlaceholder  GraphicsPlaceholder
sbs =
  2×3 graphics array:

    Axes                  Axes                 Axes
    Axes                  Axes                 GraphicsPlaceholder
sbs =
  2×3 Axes array:

    Axes    Axes    Axes
    Axes    Axes    Axes
```

```matlab
sgtitle('filtered FFT')
```

real space raw

```matlab
ax_raw_real = sbs(1,1);
f.CurrentAxes = ax_raw_real;
views(Z)
colormap(gray)
hold on
lattCoord.dt(iph).pBases
hold off
titlet('real space')
```

reciprocal space

```matlab
f.CurrentAxes = sbs(1,2)
```

```
f =
  Figure (3) with properties:

      Number: 3
        Name: ''
       Color: [1 1 1]
    Position: [423 230 560 337.3557]
       Units: 'pixels'

  Show all properties
```

```matlab
views(abs(fftshift(fZ)))
climsc([0 .001]).Minmax
```

```
ax =
  Axes with properties:
```

```
       XLim: [0.5000 561.5000]
       YLim: [0.5000 621.5000]
     XScale: 'linear'
     YScale: 'linear'
 GridLineStyle: '-'
   Position: [0.4108 0.5838 0.2134 0.3412]
      Units: 'normalized'
```

   Show all properties

```
titlet('FFT')
```

fftMask

```
f.CurrentAxes = sbs(1,3)
```

```
f =
  Figure (3) with properties:

      Number: 3
        Name: ''
       Color: [1 1 1]
    Position: [423 230 560 337.3557]
       Units: 'pixels'
```

   Show all properties

```
bin = ~ftCirc(size(Z),30)&ftCirc(size(Z),60)
```

```
bin = 561×621 logical array
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0...
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
     :
     :
```

```
views(fftshift(bin))
titlet('FFT mask')
```

maksedFFT

```
f.CurrentAxes = sbs(2,3)
```

```
f =
  Figure (3) with properties:

      Number: 3
        Name: ''
       Color: [1 1 1]
```

3

```
     Position: [423 230 560 337.3557]
        Units: 'pixels'

  Show all properties
```

```matlab
mskedFFT = fZ.*bin;
% views(bin)
abmskedFFT = abs(mskedFFT)
```

```
abmskedFFT = 561×621
10^3 ×
         0         0         0         0         0         0         0         0···
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
         0         0         0         0         0         0         0         0
    :
    :
```

```matlab
viewst(abmskedFFT)
sbs(2,3).CLim = sbs(1,2).CLim
```

```
sbs =
  2×3 Axes array:

    Axes    Axes    Axes
    Axes    Axes    Axes
```

```matlab
f.CurrentAxes = sbs(2,2)
```
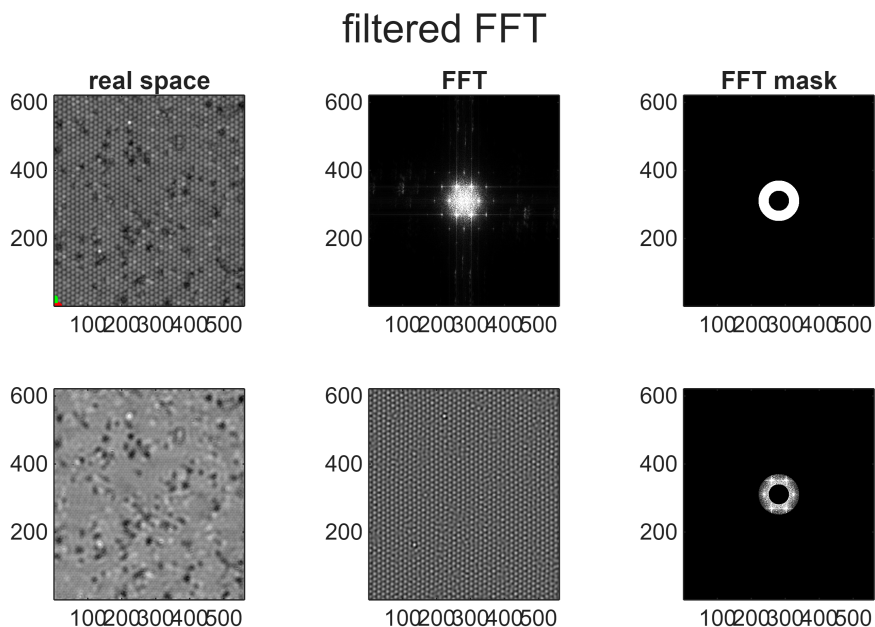
```
f =
  Figure (3) with properties:

      Number: 3
        Name: ''
       Color: [1 1 1]
    Position: [423 230 560 337.3557]
       Units: 'pixels'

  Show all properties
```

```matlab
ffiltZ = ifft2(mskedFFT)
```

```
ffiltZ = 561×621
    0.0032    0.0008    0.0000    0.0012    0.0043    0.0088    0.0139    0.0185···
    0.0025   -0.0004   -0.0013    0.0003    0.0043    0.0099    0.0161    0.0215
    0.0002   -0.0032   -0.0042   -0.0022    0.0025    0.0092    0.0165    0.0229
   -0.0035   -0.0073   -0.0083   -0.0061   -0.0008    0.0068    0.0150    0.0224
```

```
 -0.0082   -0.0123   -0.0133   -0.0110   -0.0053    0.0027    0.0118    0.0200
 -0.0134   -0.0175   -0.0187   -0.0164   -0.0107   -0.0025    0.0069    0.0156
 -0.0186   -0.0224   -0.0236   -0.0215   -0.0162   -0.0083    0.0009    0.0096
 -0.0229   -0.0262   -0.0273   -0.0255   -0.0208   -0.0138   -0.0055    0.0028
 -0.0255   -0.0281   -0.0288   -0.0274   -0.0236   -0.0179   -0.0110   -0.0039
 -0.0259   -0.0273   -0.0275   -0.0264   -0.0236   -0.0195   -0.0145   -0.0092
 -0.0233   -0.0233   -0.0229   -0.0219   -0.0202   -0.0179   -0.0151   -0.0119
 -0.0178   -0.0163   -0.0151   -0.0141   -0.0134   -0.0129   -0.0123   -0.0115
 -0.0096   -0.0068   -0.0048   -0.0038   -0.0039   -0.0050   -0.0066   -0.0082
  0.0002    0.0040    0.0067    0.0078    0.0069    0.0044    0.0008   -0.0030
  0.0103    0.0145    0.0175    0.0185    0.0171    0.0135    0.0083    0.0026
    :
    :
```

```
views(ffiltZ)
```

```
f.CurrentAxes = sbs(2,1)
```
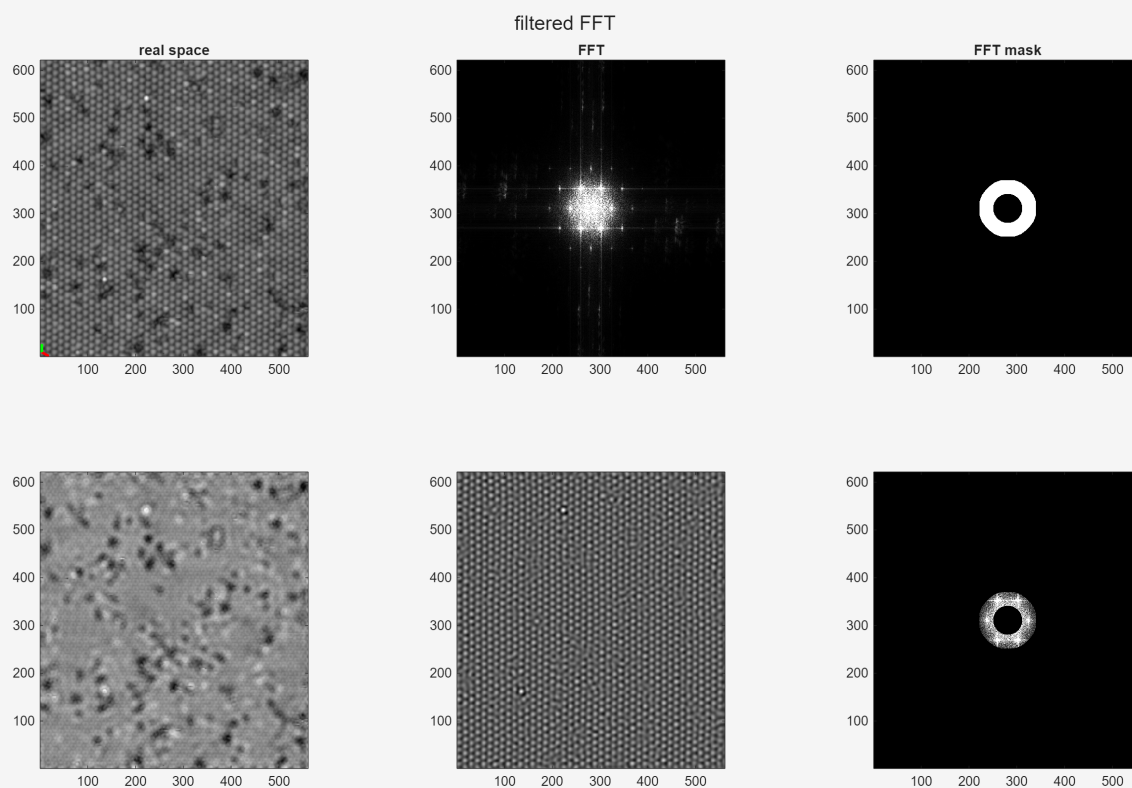
```
f =
  Figure (3) with properties:

      Number: 3
        Name: ''
       Color: [1 1 1]
    Position: [423 230 560 337.3557]
       Units: 'pixels'

  Show all properties
```

```
views(Z-ffiltZ)
```


filtered FFT

```
f.Visible = "on"
```

```
f =
```

```
Figure (3) with properties:

    Number: 3
      Name: ''
     Color: [1 1 1]
  Position: [423 230 560 337.3557]
     Units: 'pixels'

Show all properties
```

```
f.Position = [0 0 1500 900]
```



```
f =
  Figure (3) with properties:

    Number: 3
      Name: ''
     Color: [1 1 1]
  Position: [0 0 1500 900]
     Units: 'pixels'

Show all properties
```

```matlab
% close all
% f = qvisFFT(Z)
% f.CurrentAxes = findobj(f,'tag','abs')
```

```matlab
% climsc([0 .01]).Minmax
```

```matlab
function bin = ftCirc(sz,r)
x = (1:sz(1)) - floor(1+sz(1)/2);
y = (1:sz(2)) - floor(1+sz(2)/2);
[X,Y]=meshgrid(x,y);
X = X';Y=Y';
R = sqrt(X.^2+y.^2);
R = ifftshift(R);
bin = R<r;
end
```

```matlab
function f = qvisFFT(raw)
f = figure()
f.Visible ="on";
tns = ["abs" "phase" "real" "imag"];
fcns = {@abs @angle @real @imag};
cmaps = ["gray","hsv","gray","gray"]
p = 0;
for ind = 1:2
    for jsb = 1:2
        p = p + 1;
        sbs(p) = subplot(2,2,p);
        title(tns(p));
        views(fftshift(fcns{p}(fft2(raw))));
        title(tns(p));
        ax = gca();ax.Tag = tns(p);
        colormap(sbs(p),cmaps(p));
        colorbar;
    end
end
end
```

```matlab
function titlet(str)
title(str)
ax = gca;
ax.Tag = str;
end
```

```matlab
function viewst(img)
```

```
    views(fftshift(img))
end
```