

Cuts in the crystal reciprocal space

Cuts in 3, 2 or 1 dimension in any directions in the reciprocal space of the crystal using still Horace.

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```
-----  
cuts  
-----  
clear, close all  
  
% Windows  
% dirroot = '\\serdon-nv\illdata\133\in5\exp_4-01-1230\';  
% dirfinal = [dirroot,'processed\spe\'];  
  
% linux  
dirroot = '/usr/illdata/133/in5/exp_4-01-1230/';  
dirfinal = [dirroot,'processed/spe/'];  
  
% Name of the .sqw file  
data_source = [dirfinal,'tmo_2p0A_17K.sqw']; % output sqw file
```

Projection axes

Define a projection axes for the cut. Could be any orientation in the spanned reciprocal space, in particular, different from the one used to generate the .sqw file.

```
proj.u = [0,1,0]; % 2 perpendicular axes, the 3rd is calculated  
proj.v = [0,0,1];  
proj.type = 'rrr'; % units: 'r' means r.l.u, 'a' mean A-1  
proj.uoffset = [0,0,0,0]; % Origin offset of the cut
```

3D cut in the [u,v,w] plane at fixed energy

With $u=[010]$ and $v=[001]$ this is volume [HKL,hw=0]

```
%  
w1 = cut_sqw(data_source,proj,u,v,w,hw,0.05,0.05,0.05,[-0.1,0.1]);  
plot(w1) % 3D plots with sliceomatic  
view(0,0)  
  
% Optionally smooth before plotting  
w2=d3d(w1);  
w3=smooth(w2,[2,2,2]);  
plot(w3);  
view(0,90)  
  
lc 0 1e-5 % Color axis in 3D plots
```

3D cut in the [u,v,hw]: equatorial plane

With $u=[010]$ and $v = [001]$ this is volume $[0KL, hw]$

```
%
w1 = cut_sqw(data_source,proj,u v w hw
             ,0.05,0.05,[-0.05,0.05],0);
plot(w1) % 3D plots with sliceomatic
view(0,0)

% Optionally smooth before plotting
w2=d3d(w1);
w3=smooth(w2,[2,2,2]);
plot(w3);
view(0,90)
```

3D cut in the $[u,w,hw]$: a vertical plane

With $u=[010]$ and $v = [001]$ this is volume $[H0L, hw]$

```
%
w1 = cut_sqw(data_source,proj,u v w hw
             ,0.05,[-0.05,0.05],0.05,0);
plot(w1) % 3D plots with sliceomatic
view(0,0)

% Optionally smooth before plotting
w2=d3d(w1);
w3=smooth(w2,[2,2,2]);
plot(w3);
view(0,90)
```

2D cut in the $[u,0,hw]$ direction

With $u=[010]$ and $v = [001]$ this is plane $[0K0]$

```
%
w1 = cut_sqw(data_source,proj,u v w hw
             ,0.05,[-0.05,0.05],[-0.05,0.05],0);
plot(w1)

% Optionally smooth before plotting
w2=d2d(w1);
w3=smooth(w2,[2,2]);
plot(w3);

lz 0 1e-5 % Color axis in 2D plots
```

2D cut in the $[u,v, \text{fixed } hw]$: iso-energy planes

With $u=[010]$ and $v = [001]$ this is plane $[0KL]$ at $hw = 1\text{meV}$

```
%
w1 = cut_sqw(data_source,proj,u v w hw
             ,0.05,0.05,[-0.05,0.05],[0.95,1.05]);
plot(w1)

% Optionally smooth before plotting
w2=d2d(w1);
w3=smooth(w2,[2,2]);
plot(w3);
```

1D cut in the $[\text{fixed } u, \text{fixed } v, hw]$: iso-energy planes

With $u=[010]$ and $v = [001]$ this is at position $[001]$ $u v w hw$

```
w1 = cut_sqw(data_source,proj,[-0.05,0.05],[0.95,1.05],[-0.05,0.05],0);
plot(w1)
```

Save the plot

Plot type can be 'pdf', 'jpeg', 'png', 'tif', 'eps',...

```
printplot2('figure.pdf', gcf, 'pdf');
```

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