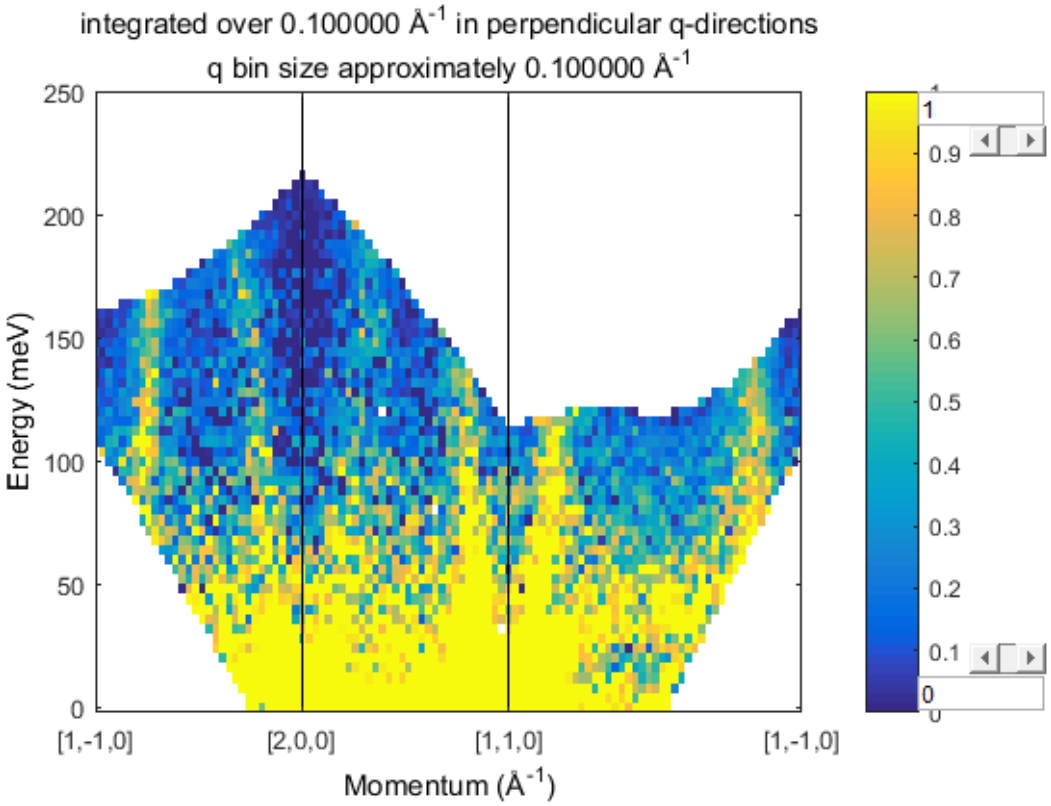
Contents

Advanced plotting and publication quality figures

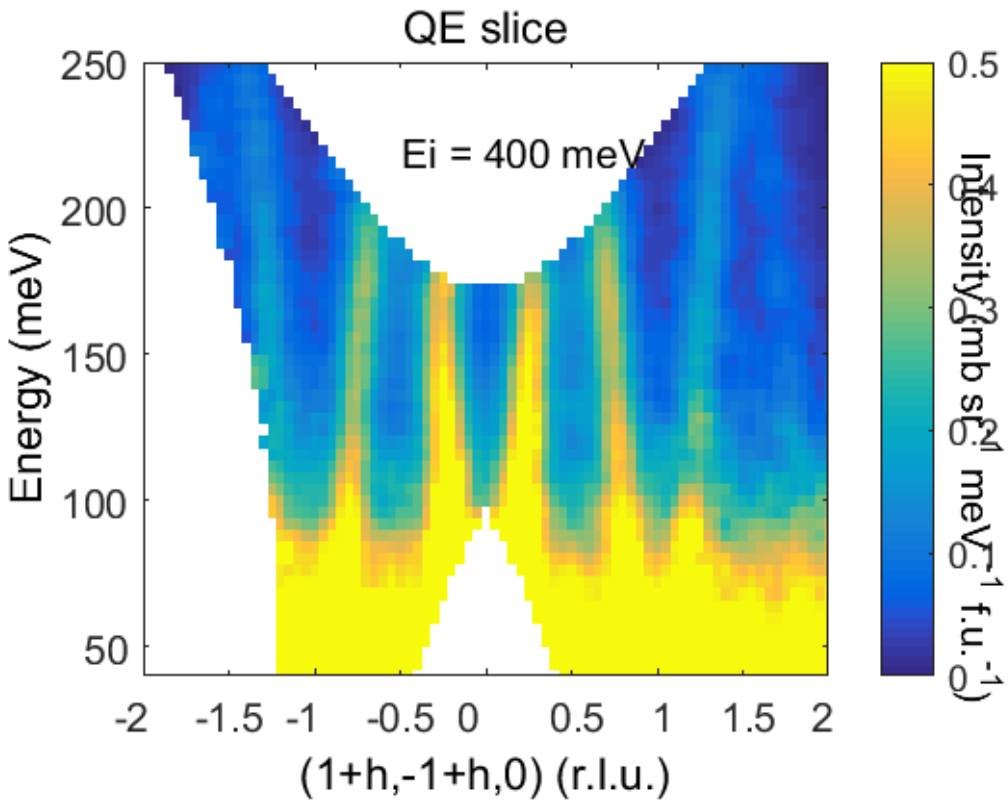
```
%Making "spaghetti plots", i.e. Q-E slices following a path along
%high-symmetry directions; customising standard Horace plots to make them
%good enough for publication.

%Let us use the following 2d slice, and 1d cuts

%Dispersion (a.k.a. "spaghetti") plots:
rlp=[1,-1,0; 2,0,0; 1,1,0; 1,-1,0];
spaghetti_plot(rlp,sqw_file,'qbin',0.1,'ebin',[0,4,250]); lz 0 1
keep_figure;
```



2d slice

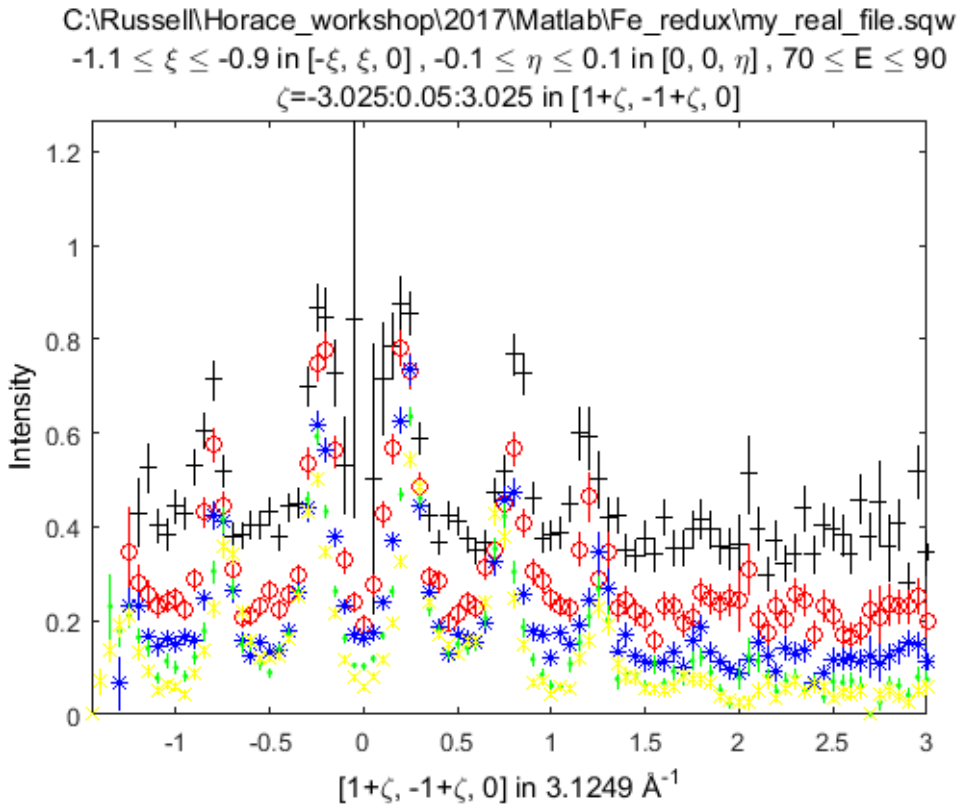
```
my_slice=cut_sqw(sqw_file,proj,[-3,0.05,3],[-1.1,-0.9],[-0.1,0.1],[0,4,280]);

%Plot the 2d slice first:
plot(smooth(compact(d2d(my_slice))));

%Set limits
lx -2 2
ly 40 250
lz 0 0.5
```

```
%Make a nicer title
title('QE slice');

%Label the axes with something nicer
xlabel('(1+h,-1+h,0) (r.l.u.)');
ylabel('Energy (meV)');

%Get rid of the colour slider
colorslider('delete');
colorbar

%If we want to set the font sizes to be bigger, then we have to re-do the
%above:
title('QE slice','FontSize',16);
xlabel('(1+h,-1+h,0) (r.l.u.)','FontSize',16);
ylabel('Energy (meV)','FontSize',16);

%To set the font size of the ticks, we need to access the figure's axes.
my_handles=get(gca)
%there are many things you can adjust! To set the font size, or any of the
%other properties, do the following:
set(gca,'FontSize',16);

%Suppose we want to change what tick marks are used on the x-axis
set(gca,'XTick',[-2,-1.5,-1,-0.5,0,0.5,1,1.5,2]);
set(gca,'XTickLabel',['-2  ';'-1.5'; '-1  ';'-0.5'; '0   ';' 0.5'; '  1 ';' 1.5';' 2  ']);

%Put some text on the figure:
text(-0.5,220,'Ei = 400 meV','FontSize',16);

%Some fancier text to label the colour bar:
tt=text(2.9,220,'Intensity (mb sr^-^1 meV ^-^1 f.u.^-^1)','FontSize',16);
set(tt,'Rotation',-90)

%Save as jpg and eps
% print('-djpeg ','C:\Russell\Horace_workshop\Matlab\fig_2d.jpg');
% print('-depsc ','C:\Russell\Horace_workshop\Matlab\fig_2d.eps');
```



1d cuts

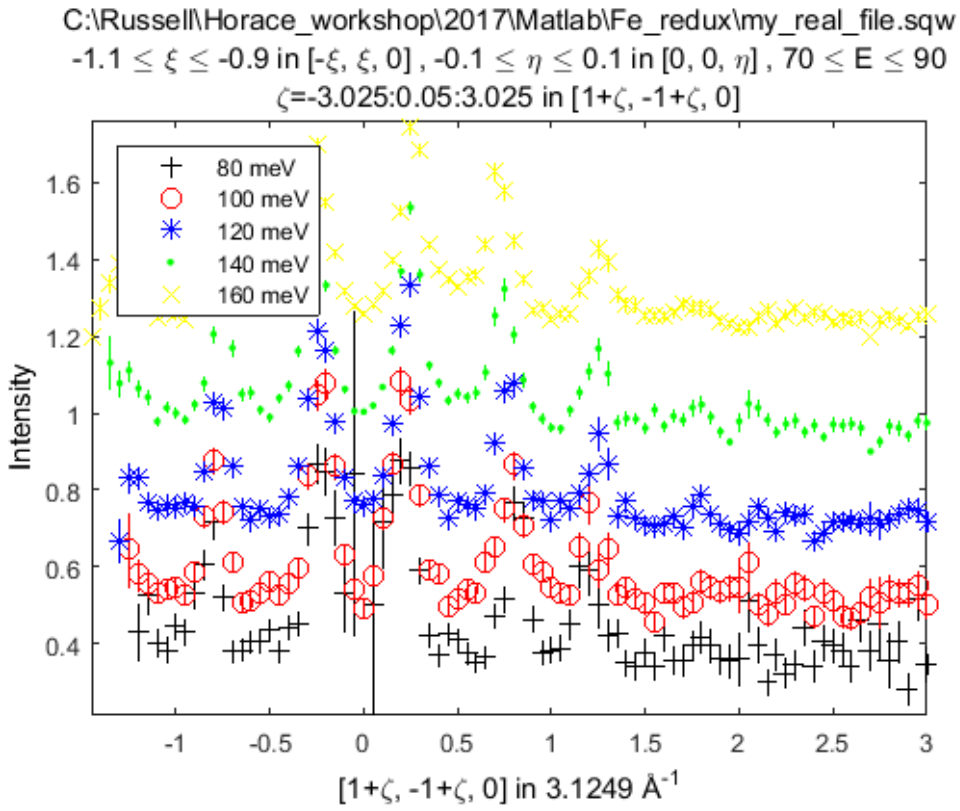
```
%Make an array of 1d cuts:

energy_range=[80:20:160];
for i=1:numel(energy_range)
    my_cut(i)=cut_sqw(sqw_file,proj,[-3,0.05,3],[-1.1,-0.9],[-0.1,0.1],[energy_range(i)-10,energy_range(i)+10]);
end

%plot them individually, to see what they look like first
% for i=1:numel(energy_range)
%     plot(my_cut(i)); keep_figure;
% end

%We want to plot them all on the same axes, with different colours and
%markers.
acolor({'black','red','blue','green','yellow'});
amark({'+', 'o', '*', '.', 'x', 's', 'd', '^', 'v', '>', '<', 'p', 'h'});%note these are all possible choices!

pp(my_cut);%pp is the command for overplotting. If there is no current plot window then this call will plot
%all of the array called "my_cut" in the same figure window
```



Add a constat offset between each cut, and make the markers bigger

```
my_offset=[0:0.3:1.2];
my_col={'black','red','blue','green','yellow'};
my_mark={'+', 'o', '*', '.', 'x', 's', 'd', '^', 'v', '>', '<', 'p', 'h'};%note these are all possible choices!

for i=1:numel(my_cut)
    acolor(my_col{i})
    amark(my_mark{i},6);
    if i==1
        plot(my_cut(i)+my_offset(i));
    else
        pp(my_cut(i)+my_offset(i));
    end
end

%Need to extend axes to see anything:
lx -2 2
ly 0 1.8

%Use the same settings as before to get nice font sizes
title('Q cuts','FontSize',16);
xlabel('(1+h,-1+h,0) (r.l.u.)','FontSize',16);
ylabel('Intensity (mb sr^-^1 meV ^-^1 f.u.^-^1)','FontSize',16);
set(gca,'FontSize',16);
set(gca,'XTick',[-2,-1.5,-1,-0.5,0,0.5,1,1.5,2]);
set(gca,'XTickLabel',['-2  ';'-1.5'; '-1  ';'-0.5'; '0   ';' 0.5'; '  1 ';' 1.5';' 2  ']);

%Insert a figure legend
%legend('80 meV','100 meV','120 meV', '140 meV','160 meV');

%But the above legend is wrong!!! This is a peculiarity of Hoarce, in that it plots the
%markers then the errorbars, and Matlab doesn't keep track of this. Luckily
%there is a workaround, by getting a "handle" to each plot and then
%attaching the legend to that.
```

```
for i=1:numel(my_cut)
    acolor(my_col{i})
    amark(my_mark{i},8);
    if i==1
        [fighan,axhan,plothan]=plot(my_cut(i)+my_offset(i));
    else
        [fighan,axhan,plothan]=pp(my_cut(i)+my_offset(i));
    end
end

legend(plothan([10,8,6,4,2]),{'80 meV','100 meV','120 meV', '140 meV','160 meV'},'Location','NorthWest');

%You can also manually edit the plot, using the arrow tool to highlight
%part of the plot you want to change. e.g. you can remove the box around
%the legend by setting its colour to be white
```



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