
Subject: Re: Plot in wavelength and energy axes
Posted by [b_gom](#) on Thu, 09 Jun 2005 23:06:58 GMT
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Is this what you want? I think the `n_skip` keyword does what you want. I can't remember where the file came from, so I've posted the code instead of a link:

```
-----
;+
; NAME:
;   non_linear_axis
;
; PURPOSE:
;   Draw an axis for a quantity that varies non-linearly
;
; CATEGORY:
;   Plotting
;
; CALLING SEQUENCE:
;   non_linear_axis,
;
; INPUTS:
;   v   = fltarr(n_v): array of values corresponding to existing
axis
;   u   = fltarr(n_v): array of values u corresponding to v: u =
f(v)
;
; KEYWORD PARAMETERS:
;   pos = ??? something to do with positioning the labels but I can't
remember
;       just what
;   format= format for axis labels. Default = '(l)'
;   title = title for axis. Default is no title
;   yaxis = 1: indicates an y axis (vertical) is to be drawn.
Default: x axis
;   charsize = size of characters. Default = 1
;   flip = not set: characters printed for top x axis or right y axis,
;         set: characters printed for bottom x axis or left y axis
;   tic_fac = length of tick marks relative to default of 1
;   n_skip = preserve only every n_skip'th label
;
; EXAMPLE:
;   Let f be an array of frequency values in wavenumbers and s be the
;   corresponding spectrum. To plot the spectrum versus wavenumber
and then
;   draw a wavelength scale on the top axis:
;   (Assume f goes from 2200 to 2500 cm-1. wavelength =
```

```

1e4/wavenumber)
;
plot,f,s,xstyle=8,ymargin=[5,5],xtitle='Wavenumber',ytitle=' Spectrum'
;      u=[4.1, 4.2, 4.3, 4.4, 4.5]      ;lable the new axis with
these values
;      non_linear_axis, 1e4/u, u, format = '(f5.1)', title =
'Wavelength'
;
; MODIFICATION HISTORY:
;   William Gallery, AER, Inc., May, 1997
;   Dec., 1998: added n_skip parameter
;               limited ticks and labels to range of existing axis
;-
PRO Non_linear_axis, v, u, du, pos=pos, format=format, title=title,
yaxis=yaxis, $
               charsize=charsize, flip=flip, tick_fac=tick_fac, $
               n_skip=n_skip ,minors=minors

IF n_elements(charsize) LE 0 THEN charsize = 1.
IF n_elements(yaxis) GT 0 THEN axis = 'y' ELSE axis = 'x'
IF n_elements(flip) LE 0 THEN BEGIN
    sign = 1      ;characters above or to right of axis
    orig = 1      ;top or right axis
    offset = 0    ;offset characters above or to right
of axis
ENDIF ELSE BEGIN
    sign = -1     ;characters below or to left of axis
    orig = 0      ;bottom or left axis
    offset = 1    ;offset characters below or to left of
axis
ENDELSE

if n_elements(tick_fac) le 0 then tick_fac = 1. ;scale factor for
tickmarks

IF n_elements(pos) LE 0 THEN BEGIN
    axis_coord = convert_coord(!X.crange, !Y.crange, /data, /to_data)
    CASE axis OF
        'x': pos = !Y.crange(orig) ;y position of x axis, bottom or
top
        'y': pos = !X.crange(orig) ;x position of y axis, right or
left
    ENDCASE
ENDIF
IF n_elements(title) LE 0 THEN title = "
IF n_elements(format) LE 0 THEN fmt = '(I)' ELSE fmt = format
IF n_elements(n_skip) LE 0 THEN n_skip = 1

```

```
;;Limit ticks and labels to within the range of the existing axis
```

```
;;CASE axis OF
```

```
; 'x': w = where(u GE !x.crange(0) AND u LE !x.crange(1))
```

```
; 'y': w = where(u GE !y.crange(0) AND u LE !y.crange(1))
```

```
;;ENDCASE
```

```
;;uu = u(w)
```

```
;;vv = v(w)
```

```
uu=u
```

```
vv=v
```

```
n_vv = n_elements(vv)
```

```
;;Need the height of a character in data coordinates
```

```
ch_size = [!D.x_ch_size/(!D.x_size*!X.s(1)), $  
           !D.y_ch_size/(!D.y_size*!Y.s(1))]*charsize
```

```
;;Convert uu to a string array
```

```
s_u = strtrim(string(uu, format=fmt), 2)
```

```
;;Find length of longest element of s_u
```

```
s_len_max = max(strlen(s_u))
```

```
;;Draw axis line
```

```
CASE axis OF
```

```
  'x': BEGIN
```

```
    ;;Draw the axis line
```

```
    plots, !X.crange, [!Y.crange(orig), !Y.crange(orig)], /data
```

```
    ;;Plot tick marks for uu
```

```
    FOR k=0, n_vv-1 DO BEGIN
```

```
      plots, [vv(k), vv(k)], [ pos,
```

```
pos-sign*ch_size(1)*tick_fac], /data
```

```
    ENDFOR
```

```
    ;;Print the values of uu centered above the tick mark
```

```
    FOR k=0, n_vv-1, n_skip DO $
```

```
      xyouts, vv(k), pos+sign*(ch_size(1)+offset)*0.4, $
```

```
      /data, align=.5, charsize=charsize, s_u(k)
```

```
  IF n_elements(minors) gt 0 THEN BEGIN
```

```
    FOR k=0, n_elements(minors)-1 DO BEGIN
```

```
      plots, [minors[k], minors[k]], [ pos,
```

```
pos-sign*ch_size(1)*tick_fac/2], /data
```

```
    ENDFOR
```

```
  endif
```

```
;;Print the title above the top axis
```

```
xyouts, total(!X.crange)/2., pos+sign*(ch_size(1)+offset)*2,
```

```
/data, $
```

```

        align=.5, charsize=charsize*1.0, title
END
'y': BEGIN
;;Draw axis line
plots, [!X.crange(1), !X.crange(1)], !Y.crange, /data

;;Plot tick marks for u
FOR k=0, n_vv-1 DO BEGIN
    plots, [pos, pos+sign*ch_size(0)*.6*tick_fac], [vv(k),
vv(k)], /data
ENDFOR

;;Print the values of u to the right of the tick mark
FOR k=0, n_vv-1, n_skip DO $
    xyouts, pos+sign*ch_size(0)*(s_len_max*orig+1), $
    vv(k)-ch_size(1)*.4, /data, align=1, charsize=charsize,
s_u(k)

IF n_elements(minors) gt 0 THEN BEGIN
    FOR k=0, n_elements(minors)-1 DO BEGIN
        plots, [pos, pos+sign*ch_size(0)*.6*tick_fac/2],
[minors(k), minors(k)], /data
    ENDFOR
endif

;;Print the title outside the axis
xyouts, pos+sign*ch_size(0)*(s_len_max+3), total(!Y.crange)/2,
$,
    /data, align=.5, charsize=charsize*1.0, orien=180+sign*90.,
title

END
ENDCASE

return
END

```

pro example

```

; Let f be an array of frequency values in wavenumbers and s be the
; corresponding spectrum.

```

```

f=findgen(300)+2200 ;f goes from 2200 to 2500 cm-1. wavelength =
1e4/wavenumber)
s=sin(f/10)

```

```

; To plot the spectrum versus wavenumber and then draw a wavelength

```

scale on the top axis:

```
plot,f,s,xstyle=8,ymargin=[5,5],xtitle='Wavenumber',ytitle=' Spectrum'  
  u=[4.1, 4.2, 4.3, 4.4, 4.5]      ;lable the new axis with  
these values  
  non_linear_axis, 1e4/u, u, format = '(f5.1)', title = 'Wavelength'
```

end

burkina wrote:

```
> Thanks Benjamin,  
>  
> but this is not what I'm looking for, because the two axes have  
> different spacings, since they're not linear to each other.  
> If I try that code on my plot, I get right major ticks at exactly the  
> same places of the major ticks of the other axis, that is at values  
> like 1.03, 0.89, 0.77, 0.69..., i.e. with spacing of 14, 12, 8...  
> which is not what I want! In this case, also, the minor ticks are  
> meaningless, they are only equally spaced.  
> I want, as in the code I posted before, major ticks at values of 1,  
> 0.9, 0.8, at the right places, corresponding to the right wavelenghts  
> (and not to the major ticks of the other axis) and minor ticks at 0.99,  
> 0.98, 0.97 a the right places, without the labels.  
>  
> There must be a way to do that!  
>  
> Thanks,  
>  
> Stefano
```
