Subject: Re: How to plot multiple charts and ho to round float to specific precision?
Posted by Patrick Broos on Thu, 28 Jul 2005 19:29:09 GMT
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I was faced with the general case of this problem, i.e. where you don't
know the magnitude of the number but you want to limit it to a certain
number of significant digits, and was moved to write the routine below.
There may be a much easier way. :)

Cheers,
Patrick Broos

```
;+
 ;============================================================ ============
;;;
;;; FILE NAME:    @(#)limit_precision.pro       8.5
;;;
;;; DESCRIPTION:  This routine converts a real number to a string with
the
;;;               specified number of significant digits.
;;;
;;; AUTHOR:       Pat Broos (patb@astro.psu.edu)
;;;               Scott Koch (tsk@astro.psu.edu)
;;;               Copyright (C) 1996, Pennsylvania State University
;;;-
 ;============================================================ ============
FUNCTION limit_precision, value, sig_digits

if (value EQ 0) then begin
  return, '0.0'
endif


;; Calculate an increment to add or subtract to value.
log_value = alog10( abs(value) )

increment = 10.0D^(ceil( log_value ) - sig_digits)


;; Determine whether we want to add to value (round UP) or
;; subtract from value (round DOWN) in order to achieve the
;; result that ROUND() would do if the significant digits
;; were shifted to the integer part of the number.
shifted_value = value/increment
round_up = (shifted_value LT round(shifted_value))

;; Adjust the value by increment until the desired condition is met.
fmt = string( sig_digits, f='("(G20.",I0,")")' )
```

```
done  = 0
steps = 0
while (NOT done) do begin
  if (round_up) then begin
    rounded_string = string( value + steps*increment, f=fmt )
    done = (value LE float( rounded_string ))
  endif else begin
    rounded_string = string( value - steps*increment, f=fmt )
    done = (value GE float( rounded_string ))
  endelse

  steps = steps + 1
  if (steps GE 100) then message, 'Loop failed to converge.'
endwhile

return, strcompress( rounded_string, /REMOVE_ALL )
end
```