
Subject: Re: Z-range

Posted by [Ben Tupper](#) on Tue, 14 Dec 1999 08:00:00 GMT

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Xiaoming XU wrote:

> Hi,
>
> how can I set the Z range in the scale of x, y when use surface?
> In other words, how the x,y,z be plotted in the same scale?
>
> Thanks!
>
> Xu

Hello,

I have used the routine AxisScaling (below) with object graphics. I think you might be able to use it to set up the position coordinates that you can specify as a keyword to surface.

Try something like the following:

```
; set [XYZ]range values to the min/max of data range you would like to see
```

```
XRange = [0,100]
```

```
Yrange = [50, 100]
```

```
Zrange = [20, 50]
```

```
; set [XYZ]position you would like the axes to occupy (of the graphics space) if
```

```
; they were all the same data range... these maybe changed by the scaling process
```

```
Xposition = [0.1, 0.9]
```

```
Yposition = [0.1,0.9]
```

```
Zposition = [0.1, 0.9]
```

```
;assuming that the xrange or yrange is the largest of all three...  
scale the position of the smaller
```

```
XYScaling = AxisScaling(Xrange,Yrange, PositionA = Xposition, PositionB  
= Yposition)
```

```
Print, 'XYScaling:', XYScaling
```

```
print, 'Xposition:', Xposition
```

```
print,'Yposition:', Yposition
```

```
;Using larger of above scales as a baseline, scale the z axis
Case XYScaling[0] of
```

```
1.0 : Zscaling = AxisScaling(Xrange, Zrange, PositionA = Xposition,
PositionB = Zposition)
```

```
Else: Zscaling = AxisScaling(Yrange,Zrange, PositionA = Yposition,
PositionB = Zposition)
```

```
EndCase
```

```
Print,'Zscaling:',Zscaling
Print, 'Zposition:',Zposition
```

```
;now set up the position keyword for 3d graphics
Position = [Xposition[0], Yposition[0], Zposition[0], Xposition[1],
Yposition[1], Zposition[1]]
```

Please let me know if it works for you.

Ben

--

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```
;+
; NAME:
; AxisScaling
;
; PURPOSE:
; This function returns a two element scaling vector given two data
ranges. It is useful
; for determining relative axis lengths.
;
; CATEGORY:
; Miscellaneous.
;
; CALLING SEQUENCE:
;
; result =AxisScaling( RangeA,RangeB)
;
```

```

; INPUTS:
; RangeA and RangeB are two element vectors of min/max values for each
data range.
;
; OPTIONAL INPUTS:
; None.
;
; KEYWORD PARAMETERS:
; PositionA, PositionB Two element vectors specifying the location of
each axis (default is [0,1])
; on output, one of the Position Vectors is adjusted to reflect the
scale of ranges.
;
; OUTPUTS:
; A two element floating point array is returned. Each element is the
relative
; scaling factor for Ranges A and B respectively.
;
; OPTIONAL OUTPUTS:
; None.
;
; COMMON BLOCKS:
; None.
;
; SIDE EFFECTS:
; None known.
;
; RESTRICTIONS:
; None known.
;
; EXAMPLE:
; Here's the steps to use to scale the axes used for displaying along
600x480 image
; into a dataspace of -.5 to .5 in each direction.
;IDL> RangeA = [0,639]
;IDL> RangeB = [0,479]
;IDL> PositionA = [-0.5,0.5]
;IDL> PositionB = [-0.5,0.5]
;IDL>
Print,AxisScaling(RangeA,RangeB,PositionA=PositionA,Position B=PositionB)

; 1.00000 0.749609 ; Note that RangeA is larger so it is scaled
at 1.0
;IDL> print,PositionA
; -0.500000 0.500000 ; Note that PositionA is unchanged since
RangeA is larger
;IDL> Print,PositionB
; -0.500000 0.249609 ;Note The PositionB is changed...

```

```

; ;its length is 74.9% of axisA's length.
;
; Then go on to normalize the coordinates using David Fanning's
procedure
;
;ScaleA = Normalize(RangeA, Position = PositionA)
;ScaleB = Normalize(RangeB,Position = PositionB)
;
; MODIFICATION HISTORY:
; Written by: Ben Tupper, 17 SEP 1999
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;
; 29 SEP 99 Added Aposition,Bposition keywords so new postion coords
can be calculated.
; Oct 1999 Changed its name to AxisScalig from RelativeScaling to
maintain
; consistency with AxisText, AxisLocate, etc. Cleaned up the
documentation.
;
;
;
;-

```

```

FUNCTION AxisScaling, RangeA, RangeB, PositionA=PositionA, PositionB =
PositionB

```

```

If n_elements(PositionA) EQ 0 Then PositionA = [0,1.]
If n_elements(PositionB) EQ 0 Then PositionB = [0,1.]

```

```

DiffA = RangeA[1] - RangeA[0]

```

```

DiffB = RangeB[1] - RangeB[0]

```

```

Ratio = DiffA/float(DiffB)

```

```

Case 1 of

```

```

Ratio GE 1: BEGIN

```

```

    Scaling = [1.0,1./Ratio]
    ;Psition A is unchanged
    PositionB = [PositionB[0],

```

```
((PositionB[1]-PositionB[0])*Scaling[1])+PositionB[0] ]  
END
```

```
Ratio LT 1: BEGIN
```

```
    Scaling = [Ratio,1.0]  
    PositionA = [PositionA[0], ((PositionA[1]-PositionA[0])*Scaling[0]  
) + PositionA[0] ]  
    ;PositionB is unchanged  
    END  
Endcase
```

```
Return, Scaling  
End
```
