Subject: Overplot non-gridded vector data on map using MSVELOVECT.pro
Posted by Tyler on Tue, 06 Nov 2007 00:55:16 GMT
View Forum Message <> Reply to Message

Hello All:

I am attempting to plot some GPS station velocity vectors over some existing data on a map. I found the MSVELOVECT procedure which seems to do what I want. However, I am struggling to understand how to use it. In particular, how to set up the velocity vectors, U & V.

The data I have is:

1) GPS station LON/LAT values
2) East magnitude of velocity
3) North magnitude of velocity

The program requires the velocity data be in 2-D, but I am unsure what the first dimension value is or the second dimension. Does anyone know how to use this?

I have provided below a snippet of how I tried to set up the data by fooling it with a data vector for U & V, but it was smarter than me.

Or am I using the wrong program altogether?

Any help is greatly appreciated.

Cheers,

t.

```
  IF (zc EQ 0) THEN BEGIN
    U = FLTARR(long(NV), 1, /NO)
    V = FLTARR(long(NV), 1, /NO)
    X = FLTARR(long(NV), /NO)
    Y = FLTARR(long(NV), /NO)

    ;; Northern Section
    ;; East Velocity
    U(0,0) = -2.44
    U(1,0) = -1.82

    ;; North velocity
    V(0,0) = 2.66
    V(1,0) = 2.11

    ;; GPS Station Lon
```

```
    X(0) = -123.8352
    X(1) = -123.0747

    ;; GPS Station Lat
    Y(0) = 39.7769
    Y(1) = 38.9952
    ;; Overplot the GPS data
    MSVELOVECT, U, V, X, Y,  COLOR = !P.COLOR, /OVERPLOT
  ENDIF
```

Subject: Re: Overplot non-gridded vector data on map using MSVELOVECT.pro
Posted by Spon on Wed, 07 Nov 2007 18:17:53 GMT
View Forum Message <> Reply to Message

On Nov 6, 12:55 am, Tyler <hayes.ty...@gmail.com> wrote:
> Hello All:
>
> I am attempting to plot some GPS station velocity vectors over some
> existing data on a map. I found the MSVELOVECT procedure which seems
> to do what I want. However, I am struggling to understand how to use
> it. In particular, how to set up the velocity vectors, U & V.
>
> The data I have is:
>
> 1) GPS station LON/LAT values
> 2) East magnitude of velocity
> 3) North magnitude of velocity
>
> The program requires the velocity data be in 2-D, but I am unsure what
> the first dimension value is or the second dimension. Does anyone know
> how to use this?
>
> I have provided below a snippet of how I tried to set up the data by
> fooling it with a data vector for U & V, but it was smarter than me.
>
> Or am I using the wrong program altogether?
>
> Any help is greatly appreciated.
>
> Cheers,
>
> t.
>
>   IF (zc EQ 0) THEN BEGIN
>   U = FLTARR(long(NV), 1, /NO)
>   V = FLTARR(long(NV), 1, /NO)
>   X = FLTARR(long(NV), /NO)

```
>       Y = FLTARR(long(NV), /NO)
>
>       ;; Northern Section
>       ;; East Velocity
>       U(0,0) = -2.44
>       U(1,0) = -1.82
>
>       ;; North velocity
>       V(0,0) = 2.66
>       V(1,0) = 2.11
>
>       ;; GPS Station Lon
>       X(0) = -123.8352
>       X(1) = -123.0747
>
>       ;; GPS Station Lat
>       Y(0) = 39.7769
>       Y(1) = 38.9952
>       ;; Overplot the GPS data
>       MSVELOVECT, U, V, X, Y,  COLOR = !P.COLOR, /OVERPLOT
>    ENDIF
```

Firstly, IDL will always 'hide' trailing dimensions of size 1, so

```
>       U = FLTARR(long(NV), 1, /NO)
```

won't work, you'll have to come up with something slyer to fool it.

Have a look at J. D. Smith's dimension juggling tutorial on David Fanning's website:
http://www.dfanning.com/tips/rebin_magic.html

Next, I don't think you'll get away without true two-dimensional U & V arrays anyway.
The way this programme seems to work is this:

***

```
MapXSize = 200
MapYSize = 100

; Four imaginary station locations and their
; respective velocity recordings:
; Location 1: (2, 10),   Velocity: (  3i +  4j)
; Location 2: (180, 6),  Velocity: (-12i +  5j)
; Location 3: (10, 88),  Velocity: (  8i -  6j)
; Location 4: (190, 90), Velocity: (-10i - 24j)

x_locations   = [2, 180, 10, 190]
y_locations   = [10, 6, 88, 90]
```

```
East_Vectors  = [3, -12, 8, -10]
North_Vectors = [4, 5, -6, -24]

; Locations of East_Vectors in grid:
U = FLTARR (MapXSize, MapYSize)
U [x_locations, y_locations] = East_Vectors

; Location of North_Vectors in grid:
V = FLTARR (MapXSize, MapYSize)
V [x_locations, y_locations] = North_Vectors

; Set length to long enough to make arrows visible in plot window
VELOVECT, U, V, TITLE = 'VELOVECT', LENGTH = 30
WINDOW, /FREE
MSVELOVECT, U, V, TITLE = 'MSVELOVECT', LENGTH = 30
```

***

Note that I'm using the version of MSVELOVECT from here:
http://cow.physics.wisc.edu/~craigm/idl/archive/msg01196.htm l
and it crashes with an out-of-subscript error in one of its FOR loops.
If you have a more recent version, it might work better; VELOVECT
seems to work just fine for me though.

> Or am I using the wrong program altogether?
You'll have to decide that one for yourself ;-)

One problem you'll have is that if you have 7 significant digits in
your LAT & LON, you'll need HUGE, sparse arrays, unless you can fudge
it a bit. Also, even by setting MISSING = Something and DOTS = 0, I
haven't spotted a way to prevent your map being overlayed with a mess
of speckles. I'm sure it can be done though.

Hope this gets you under way at least,
Chris
