Subject: cgDrawVectors over map problem?
Posted by Dave[4] on Sun, 02 Nov 2014 00:54:03 GMT
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Hi David:

I want to use cgDrawVectors to draw wind over map, like this:

```
mapNorth = Obj_New('cgMap', 'Polar Stereographic', Limit=[0, -180, 90, 180], /NoBorder)
mapNorth -> Draw

cgMap_Continents, Color='black', map_structure=mapNorth
cgMap_Grid, LatDel=15, LonDel=15, LineStyle=1, Color='charcoal', /label, lonlabel=2,
map_structure=mapNorth

cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid, thick=2,
MapCoord=mapNorth
```

In this example, the wind (u=10,v=0) should blow towards east. But the plotted wind blow towards right.

That's to say, the wind direction does not fellow the map projection. So why. Very thanks!

Dave

Subject: Re: cgDrawVectors over map problem?
Posted by David Fanning on Sun, 02 Nov 2014 17:23:15 GMT
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Dave writes:

```
>
>  Hi David:
>
>     I want to use cgDrawVectors to draw wind over map, like this:
>
>  mapNorth = Obj_New('cgMap', 'Polar Stereographic', Limit=[0, -180, 90, 180], /NoBorder)
>  mapNorth -> Draw
>
>  cgMap_Continents, Color='black', map_structure=mapNorth
>  cgMap_Grid, LatDel=15, LonDel=15, LineStyle=1, Color='charcoal', /label, lonlabel=2,
map_structure=mapNorth
>
>  cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid,
thick=2, MapCoord=mapNorth
>
```

> In this example, the wind (u=10,v=0) should blow towards east. But the plotted wind blow towards right.
>
> That's to say, the wind direction does not fellow the map projection. So why. Very thanks!

Yikes! Bit of a problem here! :-(

This took quite a lot of thinking on my part. I don't think I got much sleep last night. :-)

I understood my original mistake. I calculated the angle of the wind vectors after I set up the map projection space. What I needed to do was find a second point in the direction of the wind vectors, then transform those two points into the map projection space, before calculating the angle between them.

But then I couldn't figure out how to scale this vector to the reference vector in the map space! Sigh...

Anyway, a couple more hours playing with this after coffee (LOTS of coffee!) and I managed to get it working to my satisfaction. You can find an updated program here:

http://www.idlcoyote.com/programs/cgdrawvectors.pro

I also added a map example (well, your example!) in the documentation header. I've tried it with several other (and as perverse as I could make them) map projections, and they all seem to work correctly.

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: cgDrawVectors over map problem?
Posted by Dave[4] on Mon, 03 Nov 2014 00:10:45 GMT
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> Dave writes:
>
>>

>> Hi David:
>>
>> I want to use cgDrawVectors to draw wind over map, like this:
>>
>> mapNorth = Obj_New('cgMap', 'Polar Stereographic', Limit=[0, -180, 90, 180], /NoBorder)
>> mapNorth -> Draw
>>
>> cgMap_Continents, Color='black', map_structure=mapNorth
>> cgMap_Grid, LatDel=15, LonDel=15, LineStyle=1, Color='charcoal', /label, lonlabel=2, map_structure=mapNorth
>>
>> cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid, thick=2, MapCoord=mapNorth
>>
>> In this example, the wind (u=10,v=0) should blow towards east. But the plotted wind blow towards right.
>>
>> That's to say, the wind direction does not fellow the map projection. So why. Very thanks!
>
> Yikes! Bit of a problem here! :-(
>
> This took quite a lot of thinking on my part. I don't think I got much
> sleep last night. :-)
>
> I understood my original mistake. I calculated the angle of the wind
> vectors after I set up the map projection space. What I needed to do was
> find a second point in the direction of the wind vectors, then transform
> those two points into the map projection space, before calculating the
> angle between them.
>
> But then I couldn't figure out how to scale this vector to the reference
> vector in the map space! Sigh...
>
> Anyway, a couple more hours playing with this after coffee (LOTS of
> coffee!) and I managed to get it working to my satisfaction. You can
> find an updated program here:
>
> http://www.idlcoyote.com/programs/cgdrawvectors.pro
>
> I also added a map example (well, your example!) in the documentation
> header. I've tried it with several other (and as perverse as I could
> make them) map projections, and they all seem to work correctly.
>
> Cheers,
>
> David
> --
> David Fanning, Ph.D.

> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
> Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Hi, David:
Now cgDrawVector works with map projection. Very thanks!
Dave

Subject: Re: cgDrawVectors over map problem?
Posted by Dave[4] on Mon, 17 Nov 2014 07:20:53 GMT
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> Hi David:
>
> I want to use cgDrawVectors to draw wind over map, like this:
>
> mapNorth = Obj_New('cgMap', 'Polar Stereographic', Limit=[0, -180, 90, 180], /NoBorder)
> mapNorth -> Draw
>
> cgMap_Continents, Color='black', map_structure=mapNorth
> cgMap_Grid, LatDel=15, LonDel=15, LineStyle=1, Color='charcoal', /label, lonlabel=2, map_structure=mapNorth
>
> cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid, thick=2, MapCoord=mapNorth
>
> In this example, the wind (u=10,v=0) should blow towards east. But the plotted wind blow towards right.
>
> That's to say, the wind direction does not fellow the map projection. So why. Very thanks!
>
>
Dave

Hi david:
Another question. Now cgvector work fine with cgmap object, but not with cgmapset. Very thanks!
Dave

Subject: Re: cgDrawVectors over map problem?
Posted by David Fanning on Mon, 17 Nov 2014 13:24:00 GMT
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Dave writes:

> Another question. Now cgvector work fine with cgmap object, but not with cgmapset. Very thanks!

In what way do you think it doesn't work?

This works:

```
posx = cgScaleVector(RandomU(seed,200), -160, 160)
posy = cgScaleVector(RandomU(seed,200), -35, 70)
velx = RandomU(seed,200)-0.5
vely = RandomU(seed,200)-0.5
cgMap_Set, /Cylindrical
cgDrawVectors, velx, vely, posx, posy, /Overplot, VecColor='red'
cgMap_Grid
cgMap_Continents
```

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: cgDrawVectors over map problem?
Posted by Dave[4] on Tue, 18 Nov 2014 01:20:27 GMT
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like this:

```
cgMap_Set, 90, 45, /stereo
cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid, thick=2
cgMap_Grid
cgMap_Continents
```

the vector' direction is not right. So only /Cylindrical is ok.

Subject: Re: cgDrawVectors over map problem?
Posted by David Fanning on Tue, 18 Nov 2014 01:37:49 GMT
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Dave writes:

> like this:
>
> cgMap_Set, 90, 45, /stereo
> cgDrawVectors, 10, 0, 140, 40, vecColors='black', /Overplot, referencevector=10, /solid, thick=2

> cgMap_Grid
> cgMap_Continents
>
> the vector' direction is not right. So only /Cylindrical is ok.

Ah, but now you are asking for cgDrawVectors to have a priori knowledge of a command that was executed sometime before cgDrawVectors came onto the scene. I suppose there might be a way to parse that knowledge out of the !Map system variable, but if there is, I'm not going to discover what it is. :-)

If you want to use polar map projections, set them up with cgMap and tell cgDrawVectors about it. This approach seems pretty straightforward to me. If it were up to me, I would delete all the Map_Set projections entirely from IDL. They are VERY old. Map_Proj_Init projections are old, too, but at least they were once the creme-de-la-creme of map projection software. I guess the only thing I would even consider using cgMap_Set for would be a cylindrical projection. :-)

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. (''Perhaps thou speakest truth.'')
