
Subject: spherical gridding problem

Posted by [Jonathan Joseph](#) on Thu, 05 Apr 2001 20:27:42 GMT

[View Forum Message](#) <> [Reply to Message](#)

Help!

I'm seeing a spherical gridding problem, and I swear I've seen something similar before - but only when I've been working with large datasets, so I'm afraid I don't have a simple small example to show it - only a great whopping example.

Well, here's the description:

I have a random collection of data of the sort [longitude, latitude, value] and I would like to create a uniform cylindrical map of this data, so I use sph_scatt (equivalent to triangulate followed by trigrid).

When I do this, I sometimes see anomolous features (big positive and negative spikes) in the map. Please see <http://baritone.tn.cornell.edu/~jj/idl> for a zoomed picutre an anomaly (a 6x6 degree sample).

The anomaly seems to be more closely tied to the lat/lon locations of the data than to the data values themselves, I do see an anomaly in the same place using different data values at the same locations, however, when I tried very uniform types of data (like value = 1 everywhere or value = lat or value = lon) at the same locations, I didn't see an anomaly. This leads me to believe that the the locations of the data points in the vicinity somehow produce a very sensitive situation (a big wiggle in the interpolation) which will not manifest itself unless the data is also wiggling (ie. not close to planar) over the problem area.

A save file with lats,lons,data is at the same URL as above.

Unfortunately, this dataset has 44701 points.

In this dataset, the most glaring problem occurs at roughly longitude = -65.4, latitude = 8, The data values in this region are pretty well behaved, and the triangulation seems pretty well behaved, but big positive and negative spikes occur in the result. If I do a spherical triangulation, and a planar trigrid over the same small area, the result looks pleasant with no spikes.

Here's what I did to highlight the problem

```
IDL> print,!version
{ x86 linux unix 5.4 Sep 25 2000    32    32}
IDL> restore,'sph.dat'
```

```
IDL> help
% At $MAIN$
DATA      DOUBLE  = Array[44701]
LATS      DOUBLE  = Array[1, 44701]
LONS      DOUBLE  = Array[1, 44701]
Compiled Procedures:
  $MAIN$
```

Compiled Functions:

```
IDL> m=sph_scat(lons,lats,data,bounds=[-68.5,5,-62.5,11],nlon=401 ,nlat=401)
IDL> tvscl,m
```

or

```
IDL> shade_surf,m,ax=15,az=70
```

Has anyone seen this before, or have any ideas on why it is happening and how it might be prevented? thanks.

-Jonathan
