Subject: Re: speher keyword of qhull
Posted by Andy Heaps on Wed, 08 Nov 2006 16:12:53 GMT
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Hello Sebinjapan,
an interesting question for me as I was puzzling over the same point last week. I don't have any real answers but the following should maybe provide some illumination on the subject:

I have a strange grid of points in longitude and latitude on a globe:
LATS FLOAT = Array[722, 511]
LONGS FLOAT = Array[722, 511]
TEMPERATURE FLOAT = Array[722,511]
The longitudes (LONGS) go from -179.997 to 179.999 and the latitudes (LATS) go from -77.0105 to 89.8854. TEMPERATURE is the ocean surface temperature on this grid.

The location of the longitudes and latitudes are very irregular so triangulation data is needed to pass to the CONTOUR command. The TRIANGULATE procedure works and CONTOUR produces a pretty decent plot.
There is a wrapping problem, however, at the dateline seen as a line from the north to south poles. Adding the /SPHERE to the TRANGULATE call produces:
% TRIANGULATE: Points are co-linear, no solution.

No hope here then so I then used QHULL on the suggestion of a colleague:
If I use QHULL, longs, lats, tri, /DELAUNAY, SPHERE =1
I get:
% QHULL: Expression must be named variable in this context: <INT (1)>.

Okay, let's used a named variable:
QHULL, longs, lats, tri, SPHERE = s
HELP, s, tri
S DOUBLE = Array[3, 368943]
TRI LONG = Array[3, 733642]

Using the triangulation data TRI with CONTOUR produces a perfect plot with no dateline missing data.

So we're back to your original question - what is returned by SPHERE=s? THE IDL reference guide for version 6.0 QHULL says:
DELAUNAY Performs a Delaunay triangulation and returns the vertex indicies of the resulting polyhedra; otherwise, the convex hull of the data are returned.
SPHERE Computes the Delaunay triangulation of the points which lie on the surface of a sphere. The V0 argument contains the longitude, in degrees, and V1 contains the latitude, in degrees, of each point.

It looks like the IDL documentation could be better just here. Does
SPHERE=s imply a Delaunay triangulation and that s is the convex hull
of the data? Printing off some values of s I get:

```
PRINT, s(*, 0:3)
PRINT, 'min, max of s are', MIN(s), MAX(s)
      0.066654513      0.21466261     -0.97441118
      0.064778714      0.21523610     -0.97441118
      0.062897982      0.21579320     -0.97441118
      0.061012460      0.21633386     -0.97441118
min, max of s are     -0.99999048      0.99999800
```

Is this the sort of thing you're trying to work out as well?

Cheers
Andy

David Fanning wrote:

> sebinjapan writes:
>
>> Does anyone knows was is returned in the sphere variable when using:
>> qhull, v0, v1, tr, /delaunay, sphere = s
>
> As I read the documentation, it seems to me SPHERE is
> an input variable, with a value of 0 or 1. :-)
>
> Cheers,
>
> David
