Subject: Random problem with Delaunay triangulation
Posted by wgallery on Tue, 11 Sep 2007 18:39:43 GMT
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I am interpolating satellite data (lat, lon, temperature) from a
irregular grid to a regular lat, lon grid using:

```
pro get_gridded_temp_image, ....
.
.
.
grid_lat=findgen(31)*2.0+30.0   ;30 to 90 deg @2 deg
grid_lon=findgen(181)*2.0       ;0 to 360 deg @2 deg
qhull, x, y, tri, /delaunay, sphere = s
temp_grid = griddata( x, y, z, /sphere, /deg, $
                  /grid, xout = grid_lon, yout = grid_lat, $
                  method = 'NaturalNeighbor', $
                  triangles=tri, $
                  missing = !values.f_nan)
```

where x,y are longitude, latitude, and z is temperature (patterned
after Example 5 in the IDL help for griddata.pro)

Usually this procedure works fine, over thousands of different cases.
However, today I tried it and got the error message:

GRIDDATA: Triangle 652 not in counterclockwise order.
Execution halted at: GET_GRIDDED_TEMP_IMAGE 184

The ranges of the input variables are (mve is a routine that prints
the stats on a variable):

```
IDL> mve,x
  Variable type          mean      std dev      minimum
maximum    n_elements   NaN or I
         Float         178.55       102.79     0.070000
358.05   (529) = 529          0
IDL> mve,y
  Variable type          mean      std dev      minimum
maximum    n_elements   NaN or I
         Float         54.660       19.100       20.340
82.930   (529) = 529          0
IDL> mve,z
  Variable type          mean      std dev      minimum
maximum    n_elements   NaN or I
         Float         214.63       9.7416       192.56
233.31   (529) = 529          0
IDL> mve, tri
```

```
   Variable type           mean      std dev      minimum
maximum    n_elements    NaN or Inf
Longword integer          249.43       149.12      0.00000
528.00   (3,966) = 2898          0
```

Note: I tried the routine sph_scat which is also advertised to regrid on a sphere. However, the interpolated values are way off scale:

```
IDL> r=sph_scat(x,y,z,bounds=[0,30.0,360,90],gs=[2,2],bout=bout)
IDL> mve,r
   Variable type           mean      std dev      minimum
maximum    n_elements     NaN or Inf
    Double float          208.09       96.313      -480.31
869.93   (181,31) = 5611          0
```

Any suggestions on how to trouble shoot, fix?

Thanks,

Bill Gallery
