Subject: Re: spherical gridding problem
Posted by Jonathan Joseph on Fri, 06 Apr 2001 19:19:58 GMT

Does anyone know exactly how the spherical gridding in IDL really works? There is mention under QUINTIC of a paper by Renka, and JD was kind enough to find me an different article by Renka in the ACM titled "Interpolation of data on the surface of a
sphere" (http://www.acm.org/pubs/citations/journals/toms/1984-10-4/p4 17-renka/)
though I can't be sure that is the method used by IDL. If it is, I would suspect that the problem is somehow in the calculation of the gradients at the corners of the triangles. Though to tell the truth, I only really followed the idea and not the actual
details. Not that knowing the reason would solve my problem.

I guess for now, I'll take your idea Craig and try adding some random scatter in several passes, and try comparing the results to find problem areas. I think I need several passes, because one random scattering is bound to turn up new problems in other
places.

-Jonathan

Craig Markwardt wrote:

>
> Hi Jonathon--
>
> The results of the output are definitely not right. I can get the
> artifact to disappear or at least decrease by shifting that center
> point about 0.1 degrees in any direction.
>
> However I think this may come back to a problem some people have been
> seeing regarding TRIGRID. [TRIGRID is the underlying routine of
> SPH_SCAT.] When passed data points that are colinear then TRIGRID
> actually crashes. In spherical coordinates the problem must manifest
> when points lie on a great circle. I can imagine that if points are
> very *nearly* colinear then some kind of cancellation error occurs,
> which might give you the blow-ups you are seeing.
>
> That center point appears to be at a crossing of two sets of nearly
> colinear points, so that may indeed be a problem. However, I have to
> admit that there are a lot of other points like that.
>
> How to deal with it? Beats me. This is really something that the RSI
> people should try to fix. You could test for the error by putting
> some random scatter in your input lat/lon points and looking for major
> deviations in the result.
>
> Sorry I can't help more,
> Craig

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>  ----------------------------------------------------------- --------------
> Craig B. Markwardt, Ph.D.       EMAIL:   craigmnet@cow.physics.wisc.edu
> Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
>  ----------------------------------------------------------- --------------
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-Jonathan