Subject: Re: Interpolation from irregular to regular grid
Posted by James Kuyper on Thu, 10 Aug 2006 17:54:33 GMT
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adisn123@yahoo.com wrote:
> Hi,
>
> WHile reading a paper relavant to my project, I found one thing really
> questioning.
>
> THe paper used an interpolation method to obtain a regular
> three-dimensional grid
> from the irregular three -dimensional data set.
>
> I wonder whether there is any advantages in reforming an irregular data
> grid to a regular grid.
> Whatever the irregular data points are, aren't there the real data? If
> you change to a regular grid, then don't the data values slightly
> change?
>
>
> That is,
> my question will be
> when, and why do we want to change from an irregular grid to a regular
> grid in 3D?

The main reason is convenience. Writing routines to work with irregularly gridded data is very complicated and tricky. Routines for handling regularly gridded data are much easier to write, far more efficient, and correspondingly easier to find. The improved performance is especially noticeable in interpreted languages like IDL, where the kinds of loops you have to write to handle an irregular grid are very inefficient, and cannot be easily replaced with the much faster matrix operations.

Converting irregularly gridded data to a grid inherently involves loss of information, and introduction of extra, spurious data. Making reasonable error estimates on the results of such an analysis can be very tricky. I'd avoid it, if you can, but in this case "if you can" is a big "if".