
Subject: Spherical shells in PV-Wave

Posted by [todd](#) on Thu, 10 Feb 1994 23:02:14 GMT

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My research involves solving fluid flow problems in spherical shells where I calculate temperature, pressure and the three velocity components all in spherical co-ordinates. I use a regular (but not necessarily uniform) grid such that any field variable, $F(i,j,k)$ has the co-ordinates $r(i)$, $\theta(j)$, $\phi(k)$ {radius, colatitude and longitude, respectively}.

My problem is that the GRID_4D and FAST_GRID4 procedures don't seem to do a good job. They "bleed" information across the boundaries of the spherical shell such that the resulting uniformly gridded array contains data values far outside of the actual data domain. Part of the problem, I think, is that the resulting array, since it is cartesian, has to have spatial locations that simply do not exist in the original data set and which should in reality have a zero value.

Is there some aspect of the regridding procedure that I can modify to get better results? I have tried reducing the neighborhood and number of smoothing iterations, but to no avail.

Any suggestions that you might have would be greatly appreciated.

Thanks,

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Keywords:
