Subject: SPLINE function
Posted by jen on Fri, 10 Feb 2012 15:48:25 GMT
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Just wondering what type of spline the built in IDL SPLINE function actually solves?

In the help it just says 'cubic spline interpolation', however there are a lot of different types of spline that are based on a cubic spline or reduce to a cubic spline depending on the parameters chosen. I'd kind of assumed it was a standard cubic spline with natural boundary conditions, however I don't think this is right because:

a) There is a tension parameter, which does not exist for a cubic spline. According to the IDL help, this gives a cubic spline if the tension is set to 0, but the default is 1 - i.e. NOT a cubic spline. I've read that rational splines have a tension parameter, but I'm not sure if there are any other types of spline which have this?

b) I wrote my own simple cubic spline routine (so that I could try different boundary conditions), and it produces slightly different results to the built in SPLINE function even when I set it to natural boundary conditions.

c) I took a look at the code, and although I don't fully understand what it does, I can see some things which are definitely not part of the solution to a basic cubic spline. E.g it takes the hyperbolic sine & cosine of a function involving the tension parameter & the gradient between each pair of nodes, and seems to use this to determine the elements of the tridiagonal matrix which is solved to find the spline coefficients. I don't know what type of spline would be solved in this way?

If anyone can offer any insight on this, I'd really appreciate it.
Thanks.