

Re: integration + Levenberg–Marquardt (Numerical Recipes)

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Hello,

I am having problems getting my fitting function >derivatives correct for the Levenburg–Marquardt fitting routine.

I have a differential in the following format:
$$dAB/dt = ka * A(Bo - AB) - kd * AB$$

additional:

A is constant

I'm fitting ka, Bo and kd

I am getting the integrated format of the formula via >numerical integration (this is a test equation, they will get more >difficult).

The integration is correct when I test the resulting >data but I don't know how to properly get parameter derivatives for the >fitting function.

How do I generate the parameter derivatives (dyda in the >LM fitting function) without the integrated form of the formula (i >only have it numerically).

Thank you for any hints.

Jamie

Hi,

to get the dy/dp , you simultaneously have to solve the differential equation(s)

$$d/dt (dy/dp_i) = df/dp_i + df/dy * dy/dp_i$$

if the differential equation itself is given by

$$dy/dt = f(t, p, y(t, p)).$$

Here, the p_i are your unknown parameters.

This follows by differentiating the equation

$$dy/dt = f(t, p, y(t, p))$$

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with respect to p_i and then interchanging the order of differentiation on the left–hand side.

Most codes approximate the derivatives dy/dp by finite differences.

Best wishes

Torsten.

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