Propagation of the errors

The measurement of the N variables, called x_i, is:

$$x_{im} = x_i \pm \delta x_i$$

To calculate the error of a variable F function of the N previous x_i:

$$F = F\left(x_i\right)$$

we have to distinguish two different cases: all x_i independent, or x_i dependent:

1) all x_i independent:

$$\delta F = \sqrt{\sum_{i=1}^{N} \left(\frac{\partial F}{\partial x_i} \cdot \delta x_i \right)^2}$$

2) x_i dependent:

$$\delta F = \sum_{i=1}^{N} \left| \frac{\partial F}{\partial x_i} \cdot \delta x_i \right|$$