The 4PL logistic function in BistroMath is written as:

where:

A: the low level of the function

B: the approximate inflection point

C: the slope of the sigmoid

D: the high level

The real inflection point can be found as:

The inflection point correction is very small as the slope has typically a value in the order of 100.

The function does not perform well for x=0. Therfore the data are shifted if needed to guarantee that the whole range to fit does not include the origin. As the inflection point is closely related to the peak in the first derivative of the data this is an excellent initial value of B. Around this point a range of typically 2 cm is chosen. The first and last data point can used as estimates for the low level (A), high level (D) and slope (C) initial values for a parameter optimalisation procedure. Such a procedure needs only a few loops to converge in this case.

The inverse function can be used to calculate the position of other levels around then inflection point: