If the answer is required to a precision of d decimal digits then

$$|E_{tc}| = \left|\frac{y_{i+1}^{c} - y_{i+1}^{p}}{29}\right| < 0.5 \times 10^{-d}$$

or

$$\boxed{\left|y_{i+1}^{c} - y_{i+1}^{p}\right| < 29/2 \times 10^{-d} \approx 15 \times 10^{-d}} \tag{13.48}$$

Adams Method

The truncation error in Adams-Bashforth predictor is

$$E_{tp} = \frac{251}{720} y^{(5)}(\theta_1)\, h^5$$

and the truncation error in Adams-Moulton corrector is

$$E_{tc} = -\frac{19}{720} y^{(5)}(\theta_2) h^5$$

Then, assuming $y^{(5)}(\theta_1) = y^{(5)}(\theta_2)$, we get

$$E_{tp} = -\frac{251}{19} E_{tc}$$

Substituting in Eq. (13.47) results in

$$E_{tc} = -\frac{19}{270}\left(y_{i+1}^{c} - y_{i+1}^{p}\right)$$

For achieving an accuracy of d decimal digits,

$$\boxed{\left|y_{i+1}^{c} - y_{i+1}^{p}\right| < 270/19 \times 0.5 \times 10^{-d} \approx 7 \times 10^{-d}} \tag{13.49}$$

According to Eqs (13.48) and (13.49), h should be reduced until the difference between the corrected and predicted values is within the specified limit. It should be noted, however, that if the step length is changed during the calculation, it will be necessary to recalculate the starting points at the new step value.

Modifiers

Using the error estimates, we can modify the estimates of y_{i+1}^{c} before proceeding to the next stage. That is

$$y_{i+1} = y_{i+1}^{c} + E_{tc}$$

For Milne's method

$$y_{i+1} = y_{i+1}^{c} - \frac{1}{29}\left(y_{i+1}^{c} - y_{i+1}^{p}\right)$$