Table 2.2 Characteristics of the schemes listed in Table 2.1. The amplification factor and relative phase change are for well-resolved solutions to the oscillation equation, and $s = \omega\Delta t$. Max s is the maximum value of $\omega\Delta t$ for which the solution is nonamplifying. The storage and efficiency factors are defined in the text. No storage factor is given for implicit schemes

Method	Storage factor	Efficiency factor	Amplification factor	Phase error	Max s
Forward	2	0	$1+\frac{s^2}{2}$	$1-\frac{s^2}{3}$	0
Backward	–	∞	$1-\frac{s^2}{2}$	$1-\frac{s^2}{3}$	∞
Asselin leapfrog	3	<1	$1-\frac{\gamma s^2}{2(1-\gamma)}$	$1+\frac{(1+2\gamma)s^2}{6(1-\gamma)}$	<1
Leapfrog	2	1	1	$1+\frac{s^2}{6}$	1
Adams–Bashforth-2	3	0	$1+\frac{s^4}{4}$	$1+\frac{5}{12}s^2$	0
Trapezoidal	–	∞	1	$1-\frac{s^2}{12}$	∞
Runge–Kutta-2	2	0	$1+\frac{s^4}{8}$	$1+\frac{s^2}{6}$	0
Magazenkov	3	0.67	$1-\frac{s^4}{4}$	$1+\frac{s^2}{6}$	0.67
Leapfrog–trapezoidal	3	0.71	$1-\frac{s^4}{4}$	$1-\frac{s^2}{12}$	1.41
Adams–Bashforth-3	4	0.72	$1-\frac{3}{8}s^4$	$1+\frac{289}{720}s^4$	0.72
Adams–Moulton	–	0	$1+\frac{s^4}{24}$	$1-\frac{11}{720}s^4$	0
Adams–Bashforth–Moulton predictor corrector	4	0.60	$1-\frac{19}{144}s^4$	$1+\frac{1243}{8640}s^4$	1.20
Runge–Kutta–3	2	0.58	$1-\frac{s^4}{24}$	$1+\frac{s^4}{30}$	1.73
Runge–Kutta–4	4[a]	0.70	$1-\frac{s^6}{144}$	$1-\frac{s^4}{120}$	2.82

[a] A storage factor of 3 may be achieved following the algorithm of Blum (1962).