ODE Solvers in Matlab as of Feb 2016

Nonstiff

- ODE45 - RK of orders 4/5
  (Similar to RKF, but not quite the same)

- ODE 113 - ABM of orders 1-12, PECE scheme

- ODE 23 - RK of orders 2/3
  (Bogacki-Shampine)

Stiff

All stiff methods use the derivative matrix \( \frac{df}{dy} \)
(called Jacobian in the documentation)

Either the user can supply it (in the options command),
or the routine will estimate it

- ODE15s - variation on BDF (Klopfenstein-Shampine)

- ODE 23s - variation on RK of orders 2/3

  These are basically DIRK formulas, but
  the nonlinear equations at every step are
  replaced by a linear approximation (Rosenbrock)

- ODE 23t - (for moderately stiff problems)
  involves a trapezoidal method

- ODE 23tb - 2-stage implicit RK, where the two
  stages are trapezoidal and BDF-2

Implicit

- ODE15i - for solving \( f(t, y, y') = 0 \)

Shampine- Reichelt, The Matlab ODE Suite,