

Runge-Kutta på system av ODE

$$\frac{dy}{dx} = f(x, y(x), z(x)), \quad y(x_0) = y_0$$

$$\frac{dz}{dx} = g(x, y(x), z(x)), \quad z(x_0) = z_0$$

$$k_1 = hf(x_n, y_n, z_n)$$

$$l_1 = hg(x_n, y_n, z_n)$$

$$k_2 = hf(x_n + h/2, y_n + k_1/2, z_n + l_1/2)$$

$$l_2 = hg(x_n + h/2, y_n + k_1/2, z_n + l_1/2)$$

$$k_3 = hf(x_n + h/2, y_n + k_2/2, z_n + l_2/2)$$

$$l_3 = hg(x_n + h/2, y_n + k_2/2, z_n + l_2/2)$$

$$k_4 = hf(x_n + h, y_n + k_3, z_n + l_3)$$

$$l_4 = hg(x_n + h, y_n + k_3, z_n + l_3)$$

$$k = \frac{1}{6}(k_1 + 2k_2 + 2k_3 + k_4)$$

$$l = \frac{1}{6}(l_1 + 2l_2 + 2l_3 + l_4)$$

$$x_{n+1} = x_n + h$$

$$y_{n+1} = y_n + k$$

$$z_{n+1} = z_n + l$$