On the Fractional-Order Logistic Equation with Two Different Delays

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Z. Naturforsch. **66a,** 223 – 227 (2011); received February 25, 2010 / revised July 18, 2010

The fractional-order logistic equation with the two different delays $r_1, r_2 > 0$, $\mathrm{D}^{\alpha}x(t) = \rho x(t - r_1)[1 - x(t - r_2)]$, $t > 0$ and $\rho > 0$, with the initial data $x(t) = x_0, t \leq 0$ are considered. The existence of a unique uniformly stable solution is studied and the Adams-type predictor-corrector method is applied to obtain the numerical solution.

Key words: Logistic Delay Equation; Fractional-Order Differential Equations; Stability; Existence; Uniqueness; Numerical Solution; Predictor-Corrector Method.