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15. Numerical Analysis and Scientific Computing

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Linearly implicit Runge-Kutta discretizations of semilinear parabolic problems near equilibria

We consider a semilinear parabolic equation in the neighbourhood of a stable fixed point and its time-discretization by a linearly implicit Runge-Kutta method. We will show that, under suitable assumptions for the approximation to the Jacobian, the numerical solution has the same exponential decay as the exact one. This yields to error bounds for infinite time intervals.

Reference: A. Ostermann, and F. Schwitzer, The dynamics of linearly implicit Runge-Kutta discretizations near equilibria, in preparation.