equations by the sequence of systems of ordinary differential equations have been studied in the works of I.M. Cherevko and S.A. Ilika [8,9].

The study of the relations between the differential-difference equations and the corresponding approximating systems of ordinary differential equations allowed us to propose algorithms for solving a number of applied problems. Schemes for approximating the nonsymptotic roots of quasi-polynomials of linear differential-difference equations are proposed in [5, 7], and a method for investigating the stability of solutions of such equations is given in [8, 10]. Constructive algorithms for constructing regions of stability of linear systems with many delays were obtained in [11].

Using the approximate finding algorithms for non-asymptotic roots of quasi-polynomials, a way for constructing the coefficient areas of stability for linear differential equations with delay and finding the set of delay values for which the equation is asymptotically stable is suggested. Performed numerical experiments for model test examples confirm the effectiveness of proposed schemes for modeling the linear differential equations with delay.

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Supersymmetric polynomials on a vector space

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Let $\mathcal{D}$ be a Banach algebra. We denote by $\ell_1(\mathcal{D})$ the vector space of sequences $u = (x_1, \ldots, x_n, \ldots)$, $x_i \in \mathcal{D}$ and $\|u\| = \sum_{i=1}^{\infty} \|x_i\|$. Also we will denote by $\Lambda_1(\mathcal{D}) = \ell_1(\mathcal{D}) \times \ell_1(\mathcal{D})$ and each element $u \in \Lambda_1(\mathcal{D})$ we represent as

$$u = (y|x) = (\ldots, y_n, \ldots, y_2, y_1 | x_1, x_2, \ldots, x_n, \ldots),$$