Numerical Methods of Investigation and Solution for Integral Algebraic Equations

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Abstract: Consider systems of integral equations of the kind

$$A(t)x + V[x] = f(t), \tag{1}$$

where $V[.]$ is the Volterra operator (probably, non-linear), $A(t)$ is a square matrix, $\det A(t) = 0$ for all t in the domain, $x(t)$ is a desirable and $f(t)$ is a given vector-functions. In the paper the problem of solvability of systems (1) and numerical methods of solution are considered. The notation of index has been introduced and theorems on solvability have been proved. Sufficient conditions of convergence of differences schemes have been obtained. Application of the equations to modelling physical and technical processes is discussed.

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