

## Adomian decomposition method for nonlinear boundary-value problems unsolved with respect to the derivative in the critical case

We establish constructive necessary and sufficient conditions of solvability and a scheme for the construction of solutions for a nonlinear boundary-value problem unsolved with respect to the derivative in the critical case [1], [2], [3].

On the basis of the Adomian decomposition method [4], [5] we are constructed convergent iterative schemes for finding approximations to solutions of a nonlinear boundary-value problem unsolved with respect to the derivative [3]. As an example of application of the proposed iterative scheme, we find approximations to the solutions of periodic boundary-value problems for a Rayleigh-type equation unsolved with respect to the derivative, in particular, in the case of a periodic problem for the equation that is used to describe the motion of satellites on elliptic orbits [3].

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**Session Classification:** MATHEMATICS

**Track Classification:** MATHEMATICS