

The Volterra Series for Modeling of Input-Output Dynamical Systems

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It is known that many natural processes can be described by dynamic systems. For modeling of dynamic systems of entry-exit type, the Volterra series are used. The finite sums of series are applied. Our aim is to identify the Volterra kernels (transfer functions) by special responses of the system to the special sets of test perturbations. This problem is solved by the reduction of this problem to the multidimensional Volterra integral equations of the 1st kind via the linear combinations of reactions. The necessary and sufficient conditions of existence of the unique continuous solution of these equations are given. The software for modeling of the heat-exchange processes was created by this base.