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The solving of the initial-value problem for the Volterra integro-differential equations and ODE by the one and the same methods

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There are some wide classes for the numerical methods to solving ODE. Therefore the specialists tried to use these methods to solving of the Volterra integral and integro-differential equations. Here, we proposed the new relation between ODEs and Volterra integro-differential equation, by using which have constructed the stable multistep methods, having the higher order of accuracy. These methods were comparison with the quadrature methods and have shown their advantages. For the construction the stable methods with the higher exactness have used linear combinations of the multistep methods and multistep hybrid methods in which result are received the methods with the new properties with the degree p>=3k. And also constructed the concrete methods, which are applied to solving model problem. And have shown that by using the same algorithm one can be solved the initial value problem for Volterra integro-differential equations and ordinary differential equations.

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