ON THE PROBLEM OF INPUT RECONSTRUCTION IN A NONLINEAR SYSTEM WITH CONSTANT DELAY

V. I. Maksimov

We study the problem of reconstructing an unknown input acting on a system described by a nonlinear vector differential equation with constant delay. Both the input and the solution (trajectory) of the system are unknown. During the operation of the system, its phase states are measured at discrete times. The measurements, in general, are inaccurate. It is required to give a dynamic stable rule for the approximate reconstruction of the input, which means that the approximate values must be found in real time and the approximations must be arbitrarily accurate for sufficiently exact observations. For the solution of this problem, we propose an algorithm based on the method of models with feedback control. The algorithm reconstructs the unknown input simultaneously with the process. The algorithm is stable with respect to information noises and computational errors.

Keywords: delay systems, dynamic reconstruction, method of controlled models.

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Maksimov V.I. Dr. Phys.-Math. Sci., Prof., Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620990 Russia; Ural Federal University, Yekaterinburg, 620002 Russia, e-mail: maksimov@imm.uran.ru .