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ON AN ALGORITHM FOR THE RECONSTRUCTION OF A PERTURBATION IN A NONLINEAR SYSTEM

V. I. Maksimov

A problem of reconstruction of an unknown perturbation in a system of nonlinear ordinary differential equations is considered. The methods of solution of such problems are well known. In this paper we study a problem with two peculiarities. First, it is assumed that the phase coordinates of the dynamical system are measured (with error) at discrete sufficiently frequent times. Second, the only information known about the perturbation acting on the system is that its Euclidean norm is square integrable; i.e., the perturbation can be unbounded. Since the exact reconstruction is impossible under these assumptions, we design a solution algorithm that is stable under information noise and computation errors. The algorithm is based on the combination of elements of the theory of ill-posed problems with the extremal shift method known in the theory of positional differential games.

Keywords: linear control systems, dynamic reconstruction.

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Vyacheslav Ivanovich Maksimov Dr. Phys.-Math. Sci., Prof., Krasovskii Institute of Mathematics and Mechanics of the Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620108 Russia; Ural Federal University, Yekaterinburg, 620083 Russia, e-mail: maksimov@imm.uran.ru .

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