

# A Solution to Inverse Problems For Dynamic Control Systems<sup>1</sup>

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**Abstract:** Inverse problems of reconstruction of realized controls for dynamic control systems linear in controls and non-linear in phase coordinates are considered. It is assumed that inaccurate measurements of the realized trajectory are known.

Inverse problems have been studied by many authors. The approach suggested by Yu.S. Osipov and A.V. Kryazhimskii [1] is one of the closest to the presented material. It is originated from the differential games theory.

Another method for solving dynamic reconstruction problems by known history of inaccurate measurements has been suggested by N.N. Subbotina, E.A. Krupennikov and T.B. Tokmantsev [2, 3]. A modification of this approach is presented. It relies on necessary optimality conditions for an auxiliary variational problem of finding stationary points of a convexo-concave integral discrepancy functional. The functional is a variation of a Tikhonov regularizator.

Results of simulation are exposed.

**Keywords:** Nonlinear control systems, inverse problem, calculus of variations, hamiltonian system, necessary optimality conditions

**2010 Mathematics Subject Classification:** 49M05,34A55

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<sup>1</sup>This work was supported by the Russian Foundation for Basic Research (project no. 17-01-00074).