Correct Identification and Control of Object with Time-Delay Link

Boris Pyakillya, Vadim Zhmud

Abstract. The relevance of control of objects with delay is beyond doubt; rising number of publications proves this, in particular [1]. However, the theoretical calculation results are often very far from practical results obtained using the controller (regulator) to control these objects. We can assume that the most common reason for this is too fundamental simplification of the model in the result of the identification. It can be named uncorrecrt identification. This paper usee the example object from [1] to test its adequacy of the model and its admissibility of simplifying in relation to the task the control design with the helps of negative feedback loop. The correct identification mean usability of the result for the calculation of the regulator for the object by means of any possible method, including numerical optimization. The paper resolves the stated problem of the identification based in the comparison of the resulting transient processes from the experiment and from the simulation. In addition, it gives the results of the regulator calculation by means of numerical optimization on the base of the mathematical modeling (simulation) in program *VisSim*.

Key words: regulation, time-delay, object identification, configuration of control, modeling, simulation, simulation correctness.

REFERENCES

[1] V.V. Kurganov, A.V. Cavnin. Upravlenie ob#ektom s zapazdyvaniem. FGBOU VO NI TPU (Tomsk, Rossija). Avtomatika i programmnaja inzhenerija. 2015. № 2 (12). S. 9–13.
[2] Zhmud' V. A. Modelirovanie, issledovanie i optimizacija zamknutyh sistem avtomaticheskogo upravlenija. Monografija. Novosibirsk, Izd-vo NGTU, 2012. – 335 s.
[3] Zhmud' V.A., Zavorin A.N. Struktura modeli dlja optimizacii sistemy s obratnoj svjaz'ju. Patent RF RU 2554291 C1. Opubl. 27.06.2015. Bjull. № 18.

Vadim Zhmud

E-mail: oao_nips@bk.ru

Boris Pyakillya

E-mail: pakillaboris@gmail.com