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MASV METHOD AND ENERGY OPTIMIZATION OF CONTROL PARAMETERS

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Abstract: *The paper is focused to problems with finite and infinite models, time optimization, energy optimization parameters in the MASV method, called Method Aggregate State Variables.*

Abstrakt: *Článek popisuje problémy s konečnými a nekonečnými modely, časovou optimalizací, optimalizací parametrů MASP metodě – Metoda aregace stavové proměnné..*

Key words: *nonlinear control, optimization, aggregate state variables*
Klíčové slova: *nelineární řízení, optimalizace, agregace stavové proměnné.,*

INTRUDUCTION

The MASV method, called Method Aggregate State Variables, and its applications consist of four steps:

- mathematical model,
- control algorithm,
- simulation control,
- application in industry.

Classical formulation of the MASV method does not solve the control in the finite time and construction algorithm uses the control in the infinite time. Time optimization cannot use this formulation. In the paper we show one way of optimization control parameters **T,D.**

1 MATEMATICAL METHOD OF CONTROL SYSTEM

The following mathematical model of the nominal nonlinear subsystem will be considered

$$\dot{\mathbf{x}} = \mathbf{f}(\mathbf{x}, t) + \mathbf{G}(\mathbf{x}, t)\,\mathbf{u}, \qquad \mathbf{x}(0) = \mathbf{x}_0, \tag{1}$$

where

$\mathbf{x} = [x_1, x_2, \ldots, x_n]^T$, $\dim \mathbf{x} = n$ is the vector function of state variables,

$\mathbf{u} = [u_1, u_2, \ldots, u_m]^T$, $\dim \mathbf{u} = m$ is the vector function of control variables,

$\mathbf{f} = [x_2, \ldots, f_{r_1}, x_{r_1+2}, \ldots, f_{r_2}, x_{r_2+2}, \ldots, f_n]^T$, $\dim \mathbf{f} = n$ is a continuous vector function,

$\mathbf{G}$, $\dim \mathbf{G} = (n, m)$ is the matrix of continuous functions $g_{i,j}(x)$,

n – number of state variables (the order of the nonlinear subsystem),

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