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STEP

S/102/62/000/005/003/003  
D201/D308

AUTHORS:

Kuntsevych, V.M. and Chuhunnaya, L.I.

TITLE:

A difference-type extremal sampled-data regulator

PERIODICAL:

Avtomatyka, no. 5, 1962, 49-52

TEXT:

The authors discuss the design of a regulator utilizing pulse width modulation which realizes the following law of control:

$$\left. \begin{aligned} u &= \text{sign}(\Delta\varphi_{n-1} + a_M)(-1)^n && \text{for } nT \leq t \leq nT + \Delta t_n \\ u &= 0 && \text{for } nT + \Delta t_n < t < (n+1)T \end{aligned} \right\} (6a)$$

$$\Delta t_n = \tau \ln \frac{|\Delta\varphi_{n-1} + a_M|}{\delta}, \quad (6b)$$

where  $\tau$  is the time constant of the exponential decay of the input voltages,  $\delta$  - the operating voltage of triggers,  $T$  - constant = the repetition period. The principle of obtaining pulse width modulation consists of periodic sampling of the exponentially decay-  
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A difference-type extremal ...

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ing input voltage, so that the pulse duration at the output of the switch is related logarithmically to the input voltage amplitude. The polarity of the command voltage  $u_n$  is determined by a logic system of 'or' and 'and' circuits, the operating time  $t_n$  - by the operation of trigger circuits. The regulator is able to cope with a shift of the operating point of the system with respect to the extremum. Technical data of the regulator are given together with graphs of switching time  $\Delta t$  of the motor against the magnitude of the input voltage with the time constant  $\tau$  as a parameter. There are 5 figures.

SUBMITTED:

May 6, 1962

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