BINARY CONTROL CHARACTERISTICS
OF RESISTIVE MODELS
OF THE INDUCTION DEVICES

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General view of the equipment of Induction device

Methodical inductor

Intermittent inductor
Schematic of an induction installation with parametric models

Steinmetz balancing device applied
Parametric resistive models with impulse control

Resistive keys

Control pulses

Test circuits for models

Parallel Matrix Regulator

Serial Matrix regulator

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Application of computational algorithms

Matrix models of elements

\[
\begin{pmatrix}
0 & 0 & 1 \\
0 & 0 & -1 \\
0 & 0 & 1
\end{pmatrix}
\begin{pmatrix}
V_m(t) \\
V_n(t) \\
\dot{\alpha}_k(t)
\end{pmatrix}
= \begin{pmatrix}
0 \\
0 \\
J_k
\end{pmatrix}
\]

Computational method

\[
\begin{pmatrix}
g_{11} & \cdots & \cdots \\
\cdots & \ddots & \cdots \\
a_{11} & \cdots & \cdots
\end{pmatrix}
\begin{pmatrix}
b_{kk+1} \\
\cdots \\
a_{kk+1}
\end{pmatrix}
\begin{pmatrix}
V_k^g(t) \\
V_k^f(t) \\
\dot{\Sigma}J_k(t)
\end{pmatrix}
= \begin{pmatrix}
0 \\
0 \\
0
\end{pmatrix}
\]

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Calculation and simulation results

Control characteristics of the switches of the parametric model

Dynamics of changes in the operating parameters of the resistive model
Calculation and simulation results

Modeling modes in the simulator

Vector chart for nonsymmetrical mode
Conclusion

Control tools for parametric models are proposed

Functionality

In induction heater

In induction stirrers

Advantages

Calculation of the set of steady-state regimes

Transient Analysis