

Kudryavtsev E. V. (Nizhny Novgorod, Russia) — **Limit theorems for the flow control systems in a class of closed-loop algorithms.**

The limit properties of a sequence $\{(\Gamma_i, \kappa_i); i = 0, 1, \dots\}$ are considered, where $\Gamma_i \in \{\Gamma^{(1)}, \dots, \Gamma^{(8)}\}$ and $\kappa_i = (\kappa_{1,i}, \kappa_{2,i}) \in \{0, 1, \dots\} \times \{0, 1, \dots\} = X \times X$. Components of the vector sequence $\{(\Gamma_i, \kappa_i); i = 0, 1, \dots\}$ satisfy recurrence relations $\Gamma_{i+1} = u(\Gamma_i, \kappa_i, \eta'_i)$ and $\kappa_{i+1} = v(\Gamma_i, \kappa_i, \eta_i, \xi_i)$. In [1, 2] random vectors $\eta_i = (\eta_{1,i}, \eta_{2,i}) \in X \times X$, $\xi_i = (\xi_{1,i}, \xi_{2,i}) \in X \times X$, random element $\eta'_i \in \{(0, 0), (0, 1), (1, 0)\}$ and its distribution are defined. The Markov property of the sequence $\{(\Gamma_i, \kappa_i); i \geq 0\}$ is obtained, the classification of its states is carried out, and the conditions for the stationary mode existence are derived.

Theorem. For the limit distribution existence of the Markov sequence $\{(\Gamma_i, \kappa_i); i \geq 0\}$ it is necessary to have $\theta_1 \lambda_1 M_1 / \mu_{1,2} + \theta_2 \lambda_2 M_2 / \mu_{2,2} < 1$, where $\lambda_1, \lambda_2, M_1, M_2, \theta_1, \theta_2, \mu_{1,2}, \mu_{2,2}$ are distribution parameters for η_i and ξ_i .

Note that the sequence $\{(\Gamma_i, \kappa_i); i \geq 0\}$ is a mathematical model of a control system for conflict flows of nonhomogeneous requests.

REFERENCES

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2. *Kudryavtsev E.V., Fedotkin M.A.* Research of a Mathematical Model of Adaptive Control for Conflict Flows of Nonhomogeneous Requests. Bulletin of TvSU. Series: Applied Mathematics, 2019, No. 1, pp. 23–37.