Karachanskaya E. V. (Khabarovsk, Russia) — **Construction of a continuum of automorphic functions in $n-$dimensional ($n \geq 2$) space**

This report suggests a method for constructing function which ensures that a given function is automorphic and considers applications of this theorem to constructing systems of the Itô diffusion equations with jumps.

Theorem. Let $\mathbf{x} \in \mathbb{R}^n$, $n \geq 2$, $u : [0,T] \times \mathbb{R}^n \to \mathbb{R}^1$ and $h : [0,T] \times \mathbb{R}^n \times \mathbb{R}^m \to \mathbb{R}^n$, $m \geq 1$. The following properties are satisfied: **1**. $u(t,\mathbf{x}) \in \mathcal{C}^{1,1}_{t,\mathbf{x}}$; **2**. $h(t,\mathbf{x},\gamma) \in \mathcal{C}^{1,1,1}_{t,x,\gamma}$; **3**. $\mathbf{y}(t,\mathbf{x},\gamma)$ is a solution to the system

$$\frac{\partial \mathbf{y}(\cdot,\gamma)}{\partial \gamma} = \det \begin{bmatrix} \vec{e}_1 & \vec{e}_2 & \cdots & \vec{e}_n \\ \dfrac{\partial u(t,\mathbf{y}(\cdot,\gamma))}{\partial y_1} & \dfrac{\partial u(t,\mathbf{y}(\cdot,\gamma))}{\partial y_2} & \cdots & \dfrac{\partial u(t,\mathbf{y}(\cdot,\gamma))}{\partial y_n} \\ \varphi_{31}(t,\mathbf{y}(\cdot,\gamma)) & \varphi_{32}(t,\mathbf{y}(\cdot,\gamma)) & \cdots & \varphi_{3n}(t,\mathbf{y}(\cdot,\gamma)) \\ \cdots & \cdots & \cdots & \cdots \\ \varphi_{n1}(t,\mathbf{y}(\cdot,\gamma)) & \varphi_{n2}(t,\mathbf{y}(\cdot,\gamma)) & \cdots & \varphi_{nn}(t,\mathbf{y}(\cdot,\gamma)) \end{bmatrix},$$

under initial conditions $\mathbf{y}(t,\mathbf{x},0) = \mathbf{x}$, and a set $\{u(t,\mathbf{y}) \bigcup \{\varphi_i((t,\mathbf{y})\}_{i=3}^n\}$ that $\varphi_{ij}(\cdot) = \partial\varphi_i(\cdot)/\partial y_j$, is the set of mutually independent functions. Then the function $h(t,\mathbf{x},\gamma) = \mathbf{y}(t,\mathbf{x},\gamma) - \mathbf{x}$ ensures the automorphic transformation for any function $u(t,\mathbf{x}) \in \mathcal{C}^{1,1}_{t,\mathbf{x}}$: $u(t,\mathbf{x} + h(t,\mathbf{x},\gamma)) = u(t,\mathbf{x})$.

REFERENCES

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