Ievlev P. N. (Saint-Petersburg, Russia). **Probabilistic representation of the Cauchy problem solution for the multidimensional Schrödinger equation.**

Consider the Cauchy problem for the Schrödinger equation

$$-i\frac{\partial u}{\partial t} = \frac{1}{2}\Delta u,$$

where Δ is the laplacian operator in $\mathbb{R}^d$. A way of constructing a probabilistic representation of the solution was introduced in [1]. The idea behind it was to use the well-known representation of the Cauchy problem solution for the heat equation

$$\frac{\partial u}{\partial t} = \frac{\sigma^2}{2}\frac{\partial^2 u}{\partial x^2},$$

but with a complex $\sigma = \exp(i\pi/4)$. In the same work [1] the authors introduced some operations (in order to deal with difficulties which arise in this approach) that led them to the notion of 'generalized random variables'. The authors emphasized that this notion is of no mathematical rigor. It has turned out that a generalized random variable in the sense of work [1] can be considered as a random functional. We also use the notion of a random functional but, unlike [2], we choose a different sampling functions space and a different set of operation. The defined objects allow us to extend the previous results [1] to a multidimensional case. Namely, we construct a family of probabilistic semi-groups $\{P_\varepsilon^t\}_{\varepsilon>0}$, which converges to the semi-group $P^t = \exp(it\Delta/2)$ strongly in L_2.

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