

## **On the Fundamental Solution of the Cauchy Problem for Time Fractional Diffusion Equation on the Sphere**

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### **ABSTRACT**

Diffusion equation has many applications in sciences, not only in physics but also in biology, astrophysics and etc. Especially interest in diffusion in curved surfaces. The last has an application to biological membranes. One of the problems of biophysics is modeling of the transport of substances in the cell. This process has diffusion character. Diffusion processes in cell are complex phenomenon for modeling. For instant, model can contain fractional derivation by time. In this it is important to determine a fundamental solution of the problem. In this work as a curved surface, we consider N-dimensional sphere and study a fundamental solution of the Cauchy problem for time fractional diffusion equation. Fundamental solutions obtained as a series of distributions by spherical harmonics. Convergence of distribution expansions by spherical harmonics in weak topology is considered.

Keywords: Diffusion, sphere, fundamental solution, Cauchy problem.