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# Stochastic Riez-Fractional Partial Differential Equation with White Noise on the Half-Line

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**Abstract**

We consider a Bayesian numerical solution of a stochastic Riesz-fractional partial differential equation with white noise on the half-line. This equation is given by

$$u_t = \mathcal{D}_x^\alpha u + \mathcal{N}u + \dot{B}(x,t), \quad x,t > 0 \tag{1}$$

where $\mathcal{D}_x^\alpha$ is the Riesz-fractional derivative, $\mathcal{N}$ is a nonlinear operator and $\dot{B}(x,t)$ is the white noise. To construct the integral representation of solution we use the Fokas' Method.

*Key words:* Fractional derivative, Fokas' Method, Brownian motion.