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The Rate of Convergence of Euler Scheme for Stochastic Differential Equations with Non-Lipschitz Diffusion and Poisson Measure

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We consider the following stochastic differential equation [1]:

$$X_t = x_0 + \int_0^t a(X_s)\,ds + \sigma \int_0^t |X_s|^\alpha\,dW_s + \int_0^t \int_{\mathbb{R}} q(X_s, y)\tilde{\nu}(ds, dy) \quad (1)$$

where W is Wiener process, $\tilde{\nu}$ is centered Poisson measure. $a(x)$ and $q(x, y)$ are non-random functions, $\sigma > 0$, $\alpha \in [\frac{3}{4}, 1)$, $x_0 > 0$. We study the rate of convergence and some other properties of the corresponding symmetrized Euler scheme for stochastic differential equation (1).

[1] V. P. Zubchenko *Theory of Probability and Mathematical Statistics.* **82**, (2010), p. 30–42.