

# **The normal deviation for slow-fast systems with Lévy noise**

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This work investigates the normal deviation for a slow-fast system with Lévy noise. This is the central limit theorem for jump process. Different from the case of Brownian motion, the tightness of deviation cannot be obtained by Ascoli-Arzelà theorem directly. It is worth to mention that we use the martingale method owing to the one-to-one correspondence between the solution to SDEs and martingale problem. The perturbed test functions, which are built to eliminate the noise term through averaging, play a critical role. Then the tightness is proved with perturbed test function and truncation technique. Finally, the normal deviation, including an extra small Gaussian term, is characterized by the martingale method, perturbed test functions and exponential ergodicity property of fast component.