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Density Estimation of Lévy Measures for Discretely Observed Diffusion Processes with Jumps

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Abstract: We study a nonparametric estimation of Lévy measures for multidimensional jump-diffusion models from some discrete observations. We suppose that the jump term is driven by a Lévy process with finite Lévy measure, that is, a compound Poisson process. We construct a kernel-estimator of the Lévy density under a sampling scheme where the terminal time tends to infinity and at the same time the distance between the observations tends to zero fast enough, and show the L^2-consistency and the optimal rate in the MSE sense. First, we consider the case where the observations are given continuously and then compare it to the discretely observed case.

Key words: consistency, discrete observations, jump-diffusion, kernel density estimation, Lévy density, MSE, optimal rate

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