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Xiangfeng Yang* (xyang2@wave.tulane.edu), 327 Lauder Ave APT#1403, Moscow, ID 83843.

Large deviation expansions.

For some families of one-dimensional locally infinitely divisible Markov processes $\{\xi_t^\epsilon\}_{0 \leq t \leq T}$ with frequent small jumps, large deviation expansions for expectations are proved: as $\epsilon \downarrow 0$

$$E^\epsilon [\exp\{\epsilon^{-1}F(\xi^\epsilon)\}] = \exp\{\epsilon^{-1}[F(\phi_0) - S(\phi_0)]\} \left(\sum_{0 \leq i \leq s/2} K_i \cdot \epsilon^i + o(\epsilon^{s/2}) \right)$$

where s is a positive integer, S is the normalized action functional, constants K_i are expressed through derivatives of the smooth functional F , and ϕ_0 is the unique maximizer of $F - S$.

The proof of above large deviation expansions relies on asymptotic expansions for expectations of a smooth functional G of stochastic processes $\eta^\epsilon = \epsilon^{-1/2}(\xi^\epsilon - \phi_0) : \text{as } \epsilon \downarrow 0$

$$E^\epsilon G(\eta^\epsilon) = EG(\eta) + \epsilon^{1/2}EA_1G(\eta) + \dots + \epsilon^{s/2}EA_sG(\eta) + o(\epsilon^{s/2})$$

for some Gaussian diffusion η and suitable differential operators A_i . (Received January 18, 2012)