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Factorial moment expansion for stochastic systems. (English) Zbl 0816.60042

Stochastic Processes Appl. 56, No. 2, 321-335 (1995).

Summary: For a given functional of a simple point process, we find an analogue of Taylor's theorem for its mean value. The terms of the expansion are integrals of some real functions with respect to factorial moment measures of the point process. The remainder term is an integral of some functional with respect to a higher order Campbell measure. A special case of this expansion is Palm-Khinchin formula. The results complement previous studies of *M. I. Reiman* and *B. Simon* [*Math. Oper. Res.* 14, No. 1, 26-59 (1989; [Zbl 0665.60105](#))], *F. Baccelli* and *P. Brémaud* [*Adv. Appl. Probab.* 25, No. 1, 221-224 (1993; [Zbl 0787.60057](#))] and shed new light on light traffic approximations of *D. J. Daley* and *T. Rolski* [*Stochastic Processes Appl.* 49, No. 1, 141- 158 (1994; [Zbl 0788.60113](#))] and the author and *T. Rolski* [*Ann. Appl. Probab.* 3, No. 3, 881-896 (1993; [Zbl 0781.60081](#))].

MSC:

[60G55](#) Point processes (e.g., Poisson, Cox, Hawkes processes)

[60K25](#) Queueing theory (aspects of probability theory)

Cited in **1** Review
Cited in **13** Documents

Keywords:

higher order Campbell measure; factorial moment measure; Palm-Khinchin formula; light traffic; queue

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