

This is a review submitted to Mathematical Reviews/MathSciNet.

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Mathematical Reviews/MathSciNet Reviewer Number: 68397

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Author: Chen, Louis H. Y.; Xia, Aihua

Title: Poisson process approximation for dependent superposition of point processes.

MR Number: MR2787603

Primary classification:

Secondary classification(s):

Review text:

The authors consider the superposition of locally dependent point processes, in the sense of Chen and Xia (2004), on a locally compact metric space, such that the total mean measure is finite, and derive bounds for the deviation of the distribution of the superposition from the distribution of a Poisson process with the same mean measure. Deviations are measured via several metrics (e.g., Wasserstein and total variation). Schuhmacher (2005) also considered dependent superposition, but the approach of this paper, also based on the Stein-Chen method, uses Palm theory. The main idea is to represent the Stein-Chen operator in terms of a Markov process on the space of point processes. The idea is due to Barbour (1988) and Barbour and Brown (1992). Using Palm probabilities, the authors manage to express the error bounds in terms of the mean measures of the individual point processes, which is not possible in the paper of Schuhmacher. The main result is applied to renewal processes on an interval and to the superposition of thinned point processes.

Bibliography used in this review:

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- Chen, L.H.Y. and Xia, A. (2004). Stein's method, Palm theory and Poisson process approximation. *Ann. Probab.* **32**, 2545-2569. MR2078550
- Schuhmacher, D. (2005). Distance estimates for Poisson process approximations of dependent thinnings. *Electron. J. Probab.* **10**, 165-201 (electronic).

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