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Poisson process approximation for superposition of point processes

Abstract: By using Stein's method and Palm theory, a bound is obtained on the Wasserstein distance between a Poisson process and the superposition of a locally dependent set of point processes. The bound is expressed in terms of the means and variances of the individual point processes and the covariances between them, and is a natural generalization of the error bound in Poisson approximation. As an application, the theorem is applied to renewal processes, which in turn provides conditions for accurate Poisson process modeling of telephone traffic.