POISSON APPROXIMATION TO THE CONVOLUTION OF
POWER SERIES DISTRIBUTIONS

BY

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Abstract. In this article, we obtain, for the total variation distance, error
bounds for Poisson approximation to the convolution of power series distribu-
tions via Stein’s method. This provides a unified approach to many known
discrete distributions. Several Poisson limit theorems follow as corollaries
from our bounds. As applications, we compare Poisson approximation re-
sults with negative binomial approximation results for sums of Bernoulli,
geometric, and logarithmic series random variables.

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Key words and phrases: convolution of distributions, Poisson and negative
binomial approximation, power series distribution, Stein’s method.

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