

# Title

## Approximations related to $(k_1, k_2)$ -runs

### Abstract

In this talk, we study approximation problems for some intractable distributions, related to  $(k_1, k_2)$ -runs, to some well-known and easy to use distributions. We investigate the results by matching the moments via Stein's method. First, we discuss negative binomial approximation to sum of independent random variables which can be applied for the waiting time distribution of  $(k_1, k_2)$ -runs. Next, we consider two types of  $(k_1, k_2)$ -runs related to sum of locally dependent random variables, and obtain the pseudo-binomial approximation for the first type and discrete Gibbs measure (a family of distributions) approximation for the second type, respectively. Also, we compare the obtained results with the existing results.