

# Approximations for the Null Distribution of a Statistic Caused by Random Combinations

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## ABSTRACT

*Approximations are proposed for the null distribution of a statistic arising from the random permutations of the rows of a square matrix. The unknown probability attached with the distribution of this statistic at  $\{0\}$  is also estimated in the process of the approximation. An application related to the study of an isolated population in human genetics is demonstrated.*

Key Words: Random Permutations, Coefficient of Consanguinity, Beta Approximation, Jacobi Polynomials.

## INTRODUCTION

In a previous paper (Azuma *et al.*, 1984), a new statistic arising from the random permutations of the rows of a square matrix was considered.

This problem was originated in analyzing 52 couples selected from a fairly large data set of a Japanese isolated population pedigree tracing 7 or 8 generations back to the