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ABSTRACT OF PAPER

Title of Paper: VARIANCE ESTIMATES IN  
NESTED DESIGNS

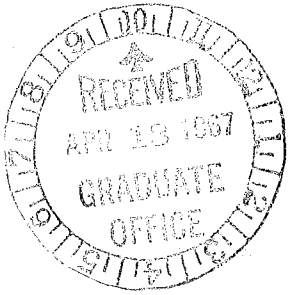
Time 20-30 minutes.

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*Accepted*

## ABSTRACT

The abstract should be in the form of a brief and concise statement of the main results or points of view of the paper, without demonstrations and with a minimum of formulae. It should not exceed 100 words and should be compressed if possible into a single paragraph. It should be written in the third person. The abstract should be typewritten and in a form suitable for immediate publication in the MONTHLY.

Abstract for

### VARIANCE ESTIMATES IN NESTED DESIGNS

by Fred C. Leone

Nested designs are widely publicized and used to isolate and estimate variances with multi-stage processes. Beyond the two-stage design, there is little information on the distributions of the estimates of variance components. "Staggered" designs and "inverted" designs are presently employed to decrease the variance of the estimates of the true variances. These are successful at the upper stages of the design at the expense of increasing the variability at the lower stages. Some results are presented, mostly empirical, for designs of size 40 and eight different combinations of variances. The frequency of occurrence of negative estimates of variance components, as well as the very strongly biased results in estimation (in the cases where  $H_0: \sigma_i^2 = 0$  is rejected) are emphasized.