

Second-Order Saturated Orthogonal Arrays of Strength Three

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Abstract: An n -run design with k two-level factors is called second-order saturated (SOS) if it is capable of estimating all the k main effects and a certain set of $n - k - 1$ two-factor interactions. Such designs maximize the degrees of freedom for two-factor interactions. Chen and Cheng (2004) showed that for k greater than $n/2$, where the maximum resolution is three, all regular designs of resolution III are SOS designs. On the other hand, for k less than or equal to $n/2$, where resolution four is possible, a regular design of resolution IV is SOS if and only if it is maximal in the sense that its resolution reduces to three whenever an extra factor is added. Such maximal designs play important roles in the construction of designs of resolution IV. After reviewing results for the regular case, we present methods of constructing nonregular SOS designs. Many new orthogonal arrays of strength three are obtained.

References

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